

# TOWN OF ARLINGTON, MASSACHUSETTS

## MINUTEMAN BIKEWAY IMPROVEMENTS

AT

# LAKE STREET

SHEET NO.	DESCRIPTION
01	TITLE SHEET
02	PLAN SYMBOLS
03	GENERAL NOTES
04	CONSTRUCTION PLAN
05	CONSTRUCTION DETAILS
06	CURB TIE & LAYOUT PLAN
07	PLAZA LAYOUT PLAN
08	GRADING PLAN
09 - 10	TRAFFIC SIGNAL PLANS
11 - 12	SEQUENCE AND TIMING PLANS
13 - 16	TRAFFIC SIGNAL DETAILS
17	PAVEMENT MARKING AND SIGNING PLAN
18	TRAFFIC SIGN SUMMARY
19	LIGHTING PLAN - BID ALTERNATE 1
20	LIGHTING PHOTOMETRICS PLAN - BID ALTERNATE 1
21	ELECTRICAL PLAN - BID ALTERNATE 1 - BID ALTERNATE 1
22	LANDSCAPE MATERIAL AND LAYOUT PLAN - BID ALTERNATE 2
23	LANDSCAPE PLANTING PLAN - BID ALTERNATE 2
24 - 26	LANDSCAPE DETAILS - BID ALTERNATE 2
27	CONSTRUCTION STAGING PLAN
28 - 32	TRAFFIC MANAGEMENT PLANS



LOCATION PLAN



SCALE IN FEET
















































































































































































TOTAL LENGTH OF PROJECT = 636.37 FEET = 0.121 MILES

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED APRIL 1, 2019, THE 2017 CONSTRUCTION STANDARD DETAILS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO TRAFFIC STANDARD DETAILS ONLY), THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.





























PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET		
DESIGN SUBMISSION: CONTRACT DOCUMENTS		
DRAWING TITLE: TITLE SHEET		
PREPARED FOR: TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476		
PREPARED BY: GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 Greenintl.com		
SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 01 OF 32
DATE: 10/11/2019	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: SM/WW	

LIGHTING DESIGN SERVICES LUMEN STUDIO, INC.		
ELETRICAL WIRING DESIGN SERVICES ENGINEERING ADVANTAGE, INC.		
NO.	DATE	REVISIONS



ABBREVIATIONS		ABBREVIATIONS (cont.)		GENERAL SYMBOLS		TRAFFIC SYMBOLS	
GENERAL		GENERAL		EXISTING	PROPOSED	EXISTING	PROPOSED
AADT	ANNUAL AVERAGE DAILY TRAFFIC	PVI	POINT OF VERTICAL INTERSECTION				
ABAN	ABANDON	PVT	POINT OF VERTICAL TANGENCY				CONTROLLER PHASE ACTUATED
ADJ	ADJUST	PVMT	PAVEMENT				TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
APPROX.	APPROXIMATE	PWW	PAVED WATER WAY				WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
A.C.	ASPHALT CONCRETE	R	RADIUS OF CURVATURE				BICYCLE VIDEO DETECTION CAMERA
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	R&D	REMOVE AND DISPOSE				PEDESTRIAN VIDEO DETECTION CAMERA
BIT.	BITUMINOUS	RCP	REINFORCED CONCRETE PIPE				PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
BC	BOTTOM OF CURB	RD	ROAD				EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
BD.	BOUND	RDWY	ROADWAY				VEHICULAR SIGNAL HEAD
BL	BASELINE	REM	REMOVE				VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
BLDG	BUILDING	RET	RETAIN				FLASHING BEACON
BM	BENCHMARK	RET WALL	RETAINING WALL				PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
BO	BY OTHERS	ROW	RIGHT OF WAY				RAILROAD SIGNAL
BOS	BOTTOM OF SLOPE	RR	RAILROAD				SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
BR.	BRIDGE	R&R	REMOVE AND RESET				MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
CB	CATCH BASIN	R&S	REMOVE AND STACK				HIGH MAST POLE OR TOWER
CBCI	CATCH BASIN WITH CURB INLET	RT	RIGHT				MAST ARM WITH LUMINAIRE
CC	CEMENT CONCRETE	SB	STONE BOUND				OPTICAL PRE-EMPTION DETECTOR
CCM	CEMENT CONCRETE MASONRY	SHLD	SHOULDER				CONTROL CABINET, GROUND MOUNTED
CEM	CEMENT	SMH	SEWER MANHOLE				CONTROL CABINET, POLE MOUNTED
CI	CURB INLET	ST	STREET				FLASHING BEACON CONTROL AND METER PEDESTAL
CIP	CAST IRON PIPE	STA	STATION				LOAD CENTER ASSEMBLY
CLF	CHAIN LINK FENCE	SSD	STOPPING SIGHT DISTANCE				PULL BOX 12"x12" (OR AS NOTED)
CL	CENTERLINE	SHLO	STATE HIGHWAY LAYOUT LINE				ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
CMP	CORRUGATED METAL PIPE	SW	SIDEWALK				TRAFFIC SIGNAL CONDUIT
CSP	CORRUGATED STEEL PIPE	T	TANGENT DISTANCE OF CURVE/TRUCK %				SINGLE-POINT VEHICLE VIDEO DETECTION CAMERA
CO.	COUNTY	TAN	TANGENT				
CONC	CONCRETE	TEMP	TEMPORARY				
CONT	CONTINUOUS	TC	TOP OF CURB				
CONST	CONSTRUCTION	TOS	TOP OF SEDIMENT				
CR GR	CROWN GRADE	TOW	TOP OF WATER				
DHV	DESIGN HOURLY VOLUME	TYP	TYPICAL				
DI	DROP INLET	UD	UNDERGROUND DRAIN PIPE				
DIA	DIAMETER	UP	UTILITY POLE				
DIP	DUCTILE IRON PIPE	VAR	VARIES				
DW	STEADY DON'T WALK - PORTLAND ORANGE	VERT	VERTICAL				
DWY	DRIVEWAY	VC	VERTICAL CURVE				
ELEV (or EL.)	ELEVATION	VGC	VERTICAL GRANITE CURB				
EMB	EMBANKMENT	VLF	VINYL FENCE				
EP	EDGE OF PAVEMENT	WCR	WHEEL CHAIR RAMP				
EXIST' (or EX)	EXISTING	WDF	WOODEN FENCE				
EXC	EXCAVATION	WG	WATER GATE				
F&C	FRAME AND COVER	WIP	WROUGHT IRON PIPE				
F&G	FRAME AND GRATE	WM	WATER METER/WATER MAIN				
FDN.	FOUNDATION	X-SECT	CROSS SECTION				
FLDSTN	FIELDSTONE						
GAR	GARAGE						
GD	GROUND						
GG	GAS GATE						
GI	GUTTER INLET						
GIP	GALVANIZED IRON PIPE						
GRAN	GRANITE						
GRAV	GRAVEL						
GRD	GUARD						
HDW	HEADWALL						
HMA	HOT MIX ASPHALT						
HOR	HORIZONTAL						
HYD	HYDRANT						
INV	INVERT						
JCT	JUNCTION						
L	LENGTH OF CURVE						
LB	LEACH BASIN						
LP	LIGHT POLE						
LT	LEFT						
MAX	MAXIMUM						
MB	MAILBOX						
MH	MANHOLE						
MHB	MASSACHUSETTS HIGHWAY BOUND						
MIN	MINIMUM						
NIC	NOT IN CONTRACT						
NO.	NUMBER						
PC	POINT OF CURVATURE						
PCC	POINT OF COMPOUND CURVATURE						
P.G.L.	PROFILE GRADE LINE						
PI	POINT OF INTERSECTION						
POC	POINT ON CURVE						
POT	POINT ON TANGENT						
PRC	POINT OF REVERSE CURVATURE						
PROJ	PROJECT						
PROP	PROPOSED						
PSB	PLANTABLE SOIL BORROW						
PT	POINT OF TANGENCY						
PVC	POINT OF VERTICAL CURVATURE						

TRAFFIC SIGNAL	
CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR AMBER
FYL	FLASHING AMBER LEFT ARROW
FYR	FLASHING AMBER RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW

PAVEMENT MARKINGS SYMBOLS	
EXISTING	PROPOSED
	
	
	
	
	
	
	
	
	
	
	
	
	
	

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET	
DESIGN SUBMISSION: CONTRACT DOCUMENTS	
DRAWING TITLE: PLAN SYMBOLS	
PREPARED FOR: TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476	
PREPARED BY: GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 Greenintl.com	
SCALE: AS NOTED	DESIGNED BY: JG
DATE: 10/11/2019	DRAWN BY: JG
PROJECT NO. 17067.015	CHECKED BY: SM/WW
NO.	DATE
REVISIONS	
SHEET NO. 02 OF 32	

E:\Projects\2017\T0670\CURRENT DESIGN\2 PLAN SYMBOLS.dwg Printed: 10/11/2019 9:27 AM



## GENERAL NOTES

1. THE WORK UNDER THIS PROJECT INCLUDES BUT IS NOT LIMITED TO FULL DEPTH BIKEWAY CONSTRUCTION, PAVEMENT RESURFACING, RECONSTRUCTION OF A HOT MIX ASPHALT SIDEWALK, INSTALLATION OF DRAINAGE STRUCTURES AND PIPES, PLACEMENT OF PAVEMENT MARKINGS, PROTECTION OF EXISTING UTILITIES TO REMAIN, GRADING, INSTALLATION OF TRAFFIC SIGNS, INSTALLATION OF NEW SIGNAL EQUIPMENT, AND TRAFFIC MAINTENANCE DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL CONFLICTS BETWEEN THE EXISTING UTILITIES AND PROPOSED WORK. THE ENGINEER RESERVES THE RIGHT TO MODIFY THE DESIGN TO REALIGN PIPING AND STRUCTURE LOCATIONS AND INVERTS TO SUIT ACTUAL FIELD CONDITIONS ENCOUNTERED.
3. ALL EXISTING STREET NAME, REGULATORY, GUIDE, AND WARNING SIGNS, INCLUDING POSTS, WITHIN THE LIMITS OF WORK ARE TO BE RETAINED UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL RETAIN AND PROTECT ALL CURBS, FENCES, WALLS, TREES, SHRUBS, POSTS, LANDSCAPE FEATURES, AND OTHER MISCELLANEOUS ITEMS WITHIN ABUTTING PROPERTIES UNLESS OTHERWISE NOTED. WHEN RETAINING THOSE ITEMS IS NOT PRACTICAL IN THE OPINION OF THE ENGINEER, THE CONTRACTOR SHALL REMOVE, STOCKPILE, PROTECT AND RESET THE ITEMS. THE CONTRACTOR SHALL REPLACE ITEMS DAMAGED DURING REMOVAL, STOCKPILING, OR RESETTING DUE TO NEGLIGENCE, CARELESSNESS, OR MISHANDLING WITH EQUIVALENT NEW ITEMS AT NO COST TO THE TOWN.
5. THE CONTRACTOR SHALL PROVIDE ALL SAFETY CONTROL (SIGNS, REFLECTORIZED DRUMS, ETC) FOR CONSTRUCTION OPERATIONS IN ACCORDANCE WITH THE TRAFFIC MANAGEMENT PLANS INCLUDED HEREIN AND THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. PROVIDING SAFETY CONTROLS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE.
6. ALL TREES SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED. THE COSTS FOR PROTECTION IS INCLUDED IN THE LUMP SUM BID PRICE.
7. ALL GRATES, FRAMES AND COVERS OF STRUCTURES TO BE REMOVED OR ABANDONED SHALL BE DELIVERED BY THE CONTRACTOR TO THE TOWN OF ARLINGTON HIGHWAY DEPARTMENT AND STACKED AT A LOCATION DESIGNATED BY THE TOWN.
8. ALL UTILITIES AND THEIR APPURTENANCES SHALL BE RETAINED AND PROTECTED UNLESS OTHERWISE NOTED
9. ALL RCP SHALL BE CLASS III UNLESS OTHERWISE NOTED.

## PLAN NOTES

1. THE BASE MAP IS COMPILED FROM AN ACTUAL-ON-THE-GROUND TOPOGRAPHIC SURVEY PERFORMED BY GREEN INTERNATIONAL AFFILIATES, INC. JULY, 2017
2. THIS DRAWING WAS PREPARED SOLELY FOR AND IS INTENDED FOR THE WORK ASSOCIATED WITH THIS PROJECT. THE USE OR REUSE OF THESE DRAWINGS FOR OTHER PURPOSES OR BY PARTIES NOT DIRECTLY CONTRACTED TO THIS PROJECT IS PROHIBITED WITHOUT PRIOR WRITTEN PERMISSION.
3. HORIZONTAL AND VERTICAL CONTROL WAS ESTABLISHED BY GREEN ON JULY 21, 2017 WITH STATIC GPS VECTORS CALCULATED BY NATIONAL GEODETIC SURVEY'S OPUS SERVICE. HORIZONTAL DATUM IS BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM, NAD83 (2011) EPOCH 2010.0000, VERTICAL DATUM IS NAVD 88 (COMPUTED USING GEOID12B) CONVERTED TO ARLINGTON TOWN BASE.
4. THE RIGHT OF WAY LINES SHOWN ON THIS BASE MAP ARE THE DIRECT RESULT OF AN INSTRUMENT SURVEY PERFORMED ON THE GROUND BY GREEN AND FROM PLANS AND DEEDS OF RECORD. PRIVATE PROPERTY LINES HAVE NOT BEEN SURVEYED, THEY ARE COMPILED FROM GIS & RECORD PLAN INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE.
5. UNDERGROUND UTILITIES SHOWN ARE BASED UPON FIELD OBSERVATIONS AND PLANS OF RECORD. THESE UTILITIES ARE NOT WARRANTED TO BE CORRECT NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES ARE SHOWN.

## UTILITY NOTES

1. THE CONTRACTOR IS HEREBY MADE AWARE THAT EXISTING UTILITIES, INCLUDING BUT NOT LIMITED TO EXISTING WATER AND DRAIN PIPES; DRAINAGE AND SEWER STRUCTURES; GAS LINES, COMMUNICATION LINES AND UTILITY POLES, MAY NEED TO BE PROTECTED AND/OR SHORED UP DURING THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS UNDER THIS PROJECT. THE COST OF THE WORK REQUIRED FOR THE PROTECTION, MAINTENANCE AND SUPPORT OF THESE OR OTHER EXISTING ABOVEGROUND OR UNDERGROUND UTILITIES IN THE VICINITY OF THE PROPOSED WORK SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE WORK UNDER THIS CONTRACT.
2. THIS PLAN WAS PREPARED IN CONFORMANCE WITH AMERICAN SOCIETY OF CIVIL ENGINEERS STANDARD C/ASCE 38-02 "STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA", QL"C". REFER TO UTILITY QUALITY LEVEL INFORMATION INDEX. ACCURACY OF UTILITY LOCATIONS IS NOT GUARANTEED.
3. BELOW GROUND STRUCTURES, UNLESS DIMENSIONED, ARE SYMBOLIC ONLY.
4. PRIOR TO THE START OF ANY WORK ON THE SITE, THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATION OF ALL UTILITIES, SHOWN OR NOT SHOWN ON THIS PLAN. CONTACT DIG-SAFE AT 1-888-344-7233 (1-888-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO THE START OF EXCAVATION.
5. IF AN EXISTING PIPE TO BE REMOVED EXTENDS OUTSIDE THE PROPOSED ROADWAY LIMIT, IT SHALL BE CUT BEYOND THE ROADWAY AND CAPPED AT NO ADDITIONAL COST.

UTILITY QUALITY LEVEL INFORMATION INDEX (SEE ASCE/CI 38-02):

**UTILITY QUALITY LEVEL A:**  
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER. INFORMATION IS ONLY VALID WITHIN THE VISIBLE LIMITS OF THE TEST HOLE.


UTILITY QUALITY LEVEL B:  
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

**UTILITY QUALITY LEVEL C:**  
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

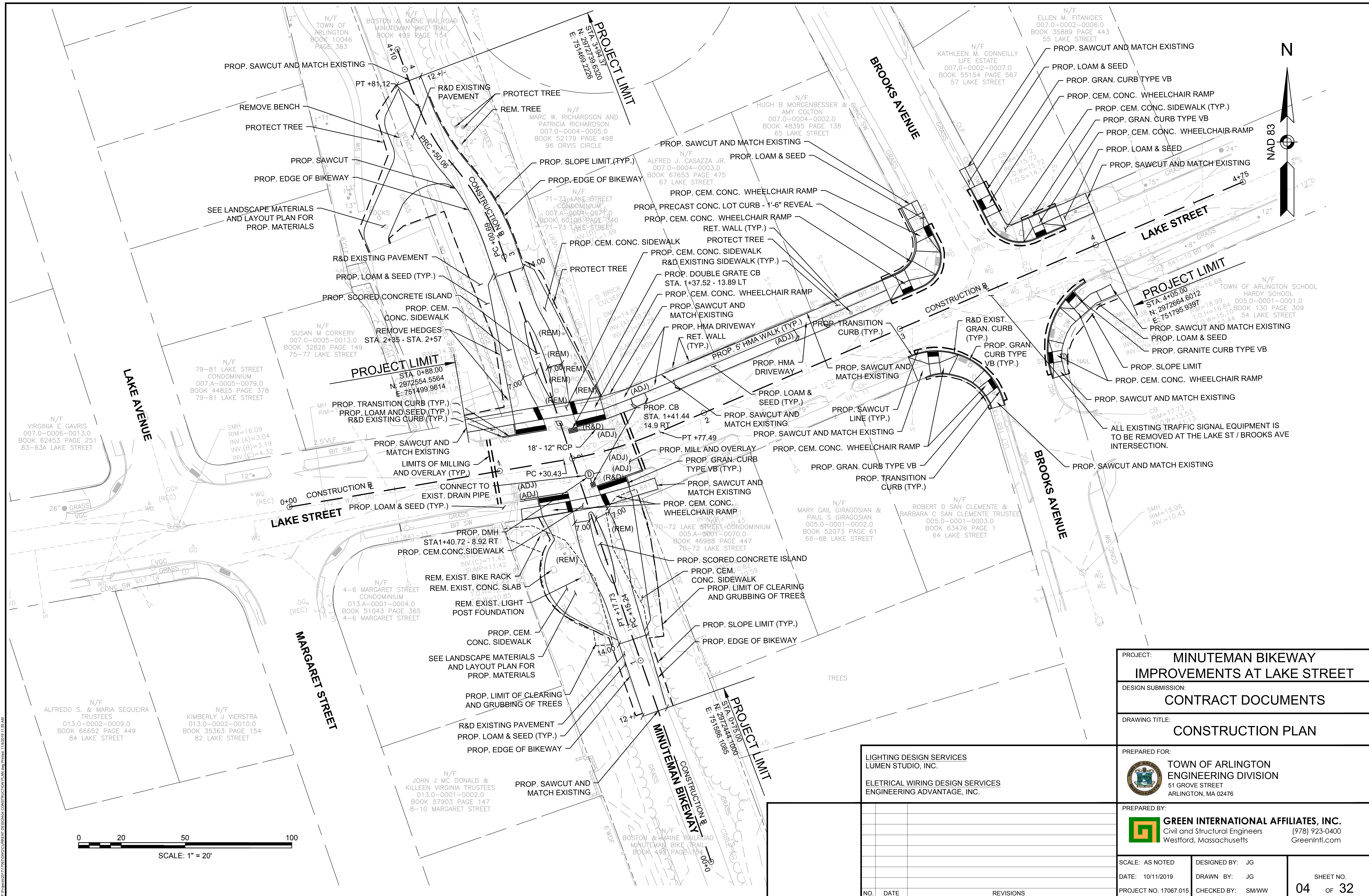
UTILITY QUALITY LEVEL D:  
INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

## DRAINAGE NOTES

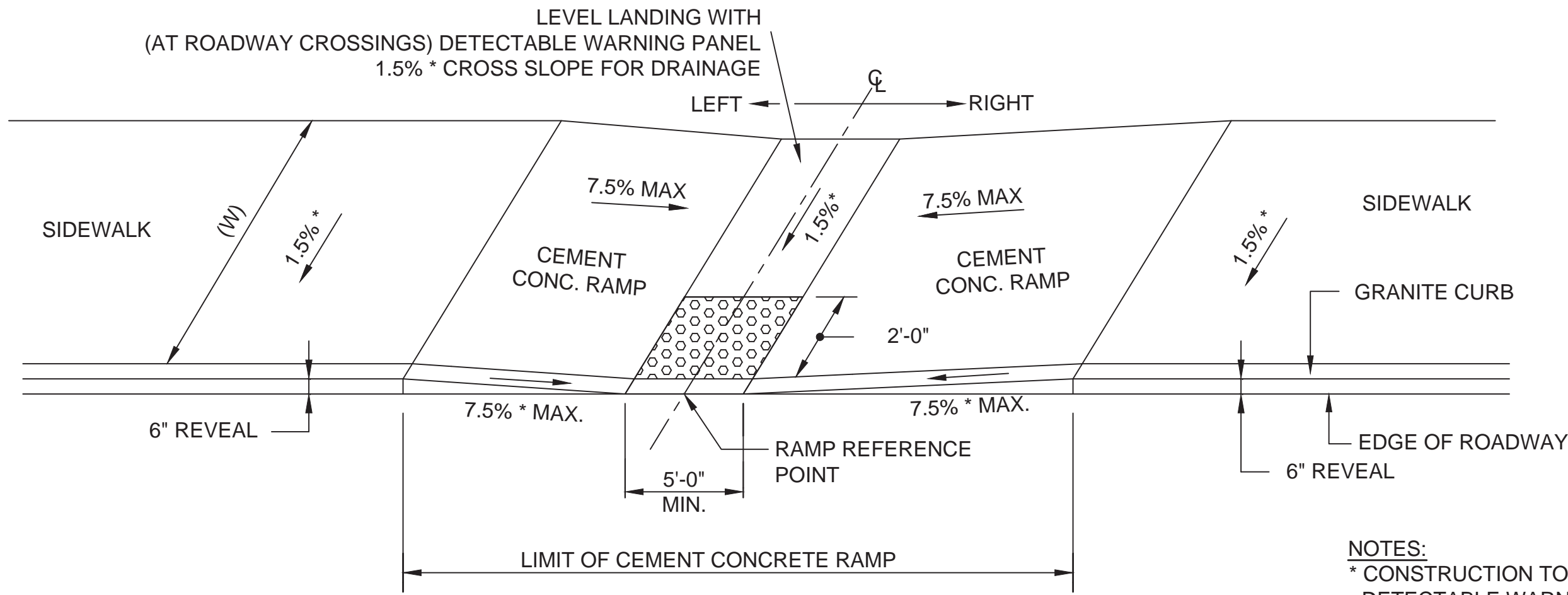
1. COMPACTED  $\frac{3}{4}$ " CRUSHED STONE SHALL BE PLACED TO A MINIMUM DEPTH OF 12" BENEATH ALL NEW MANHOLES AND CATCH BASINS.
2. COMPACTED  $\frac{3}{4}$ " CRUSHED STONE SHALL BE PLACED TO A MINIMUM DEPTH OF 6" BELOW THE INVERT OF ALL DRAINAGE PIPES UP TO THE SPRING LINE OF THE PROPOSED PIPE, AS SHOWN IN THE TYPICAL PIPE TRENCH DETAIL (SEE SHEET 19).
3. ALL OFFSETS TO THE CATCH BASINS ARE TO THE BACK CENTER OF THE GRATE. THE LOCATION AND ORIENTATION OF THE BELOW GRADE STRUCTURE SHALL BE FIELD COORDINATED BY THE CONTRACTOR TO AVOID CONFLICTS WITH EXISTING UTILITIES.
4. ALL STRUCTURES SHALL HAVE ECCENTRIC CONES UNLESS THEY ARE FLAT SLABS OR AS OTHERWISE REQUIRED BY THE ENGINEER.
5. ALL STRUCTURES SHALL MEET HS-25 LOADING.
6. ALL STRUCTURES TO BE MANUFACTURED TO MEET OR EXCEED ASTM C-478 AND AASHTO M199 SPECS.
7. ALL REINFORCING FOR EACH STRUCTURE SHALL CONFORM TO ASTM A-165 AND BE PLACED AS PER ASTM C-478.
8. ALL CONCRETE TO BE 4000 PSI (MINIMUM) CEMENT PER ASTM C-478.
9. BUTYL RUBBER JOINT SEALANT PER ASTM C-990 AND AASHTO M-198. WATERPROOFING PER CONTRACT SPECS.

			PROJECT: <b>MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET</b>		
			DESIGN SUBMISSION: <b>CONTRACT DOCUMENTS</b>		
			DRAWING TITLE: <b>GENERAL NOTES</b>		
LIGHTING DESIGN SERVICES LUMEN STUDIO, INC.			PREPARED FOR:  <b>TOWN OF ARLINGTON ENGINEERING DIVISION</b> 51 GROVE STREET ARLINGTON, MA 02476		
ELETRICAL WIRING DESIGN SERVICES ENGINEERING ADVANTAGE, INC.			PREPARED BY:  <b>GREEN INTERNATIONAL AFFILIATES, INC.</b> Civil and Structural Engineers (978) 923-0400 Westford, Massachusetts GreenIntl.com		
			SCALE: AS NOTED		DESIGNED BY: JG
			DATE: 10/11/2019		DRAWN BY: JG
			PROJECT NO. 17067.015		CHECKED BY: SM/WW
NO.	DATE	REVISIONS			SHEET NO. <b>03</b> OF <b>32</b>









CURB CUT RAMP (NARROW SIDEWALK) DETAIL E 107.2.1

NOT TO SCALE

WCR #	BASELINE	RAMP REFERENCE POINT		WIDTH OF RAMP (FT.)	WIDTH OF SIDEWALK (W) (FT.)	TRANSITION LENGTH		3" REVEAL	6" REVEAL
		STATION	OFFSET			LEFT SIDE	RIGHT SIDE		
7	LAKE ST	03+30.55	38.66 RT	5'-0"	6'-6"	6'-6"	3'-10"	RIGHT SIDE	LEFT SIDE
11	LAKE ST	03+57.09	38.32 LT	5'-0"	6'-6"	6'-6"	3'-10"	RIGHT SIDE	LEFT SIDE

PAVEMENT NOTES

PROPOSED BIKEWAY

SURFACE: 3 1/2" HOT MIX ASPHALT PAVEMENT PLACED IN TWO LAYERS  
SUBBASE: 1 3/4" TOP COURSE MATERIAL OVER 1 3/4" BINDER COURSE MATERIAL  
8" GRAVEL BORROW (TYPE B)

PROPOSED PAVEMENT MILLING AND RESURFACING

SURFACE: 2" HOT MIX ASPHALT MODIFIED TOP COURSE  
±2" PAVEMENT MILLING  
(VARIABLE DEPTH TO MEET PROPOSED GRADING)

NOTE:  
ASPHALT EMULSION FOR TACK COAT (RS-1) SHALL BE APPLIED AT A RATE OF 0.05 GAL/SY OVER NEW AND SMOOTH INTERMEDIATE COURSES.  
ASPHALT EMULSION FOR TACK COAT (RS-1) SHALL BE APPLIED AT A RATE OF 0.07 GAL/SY OVER MILLED SURFACES.

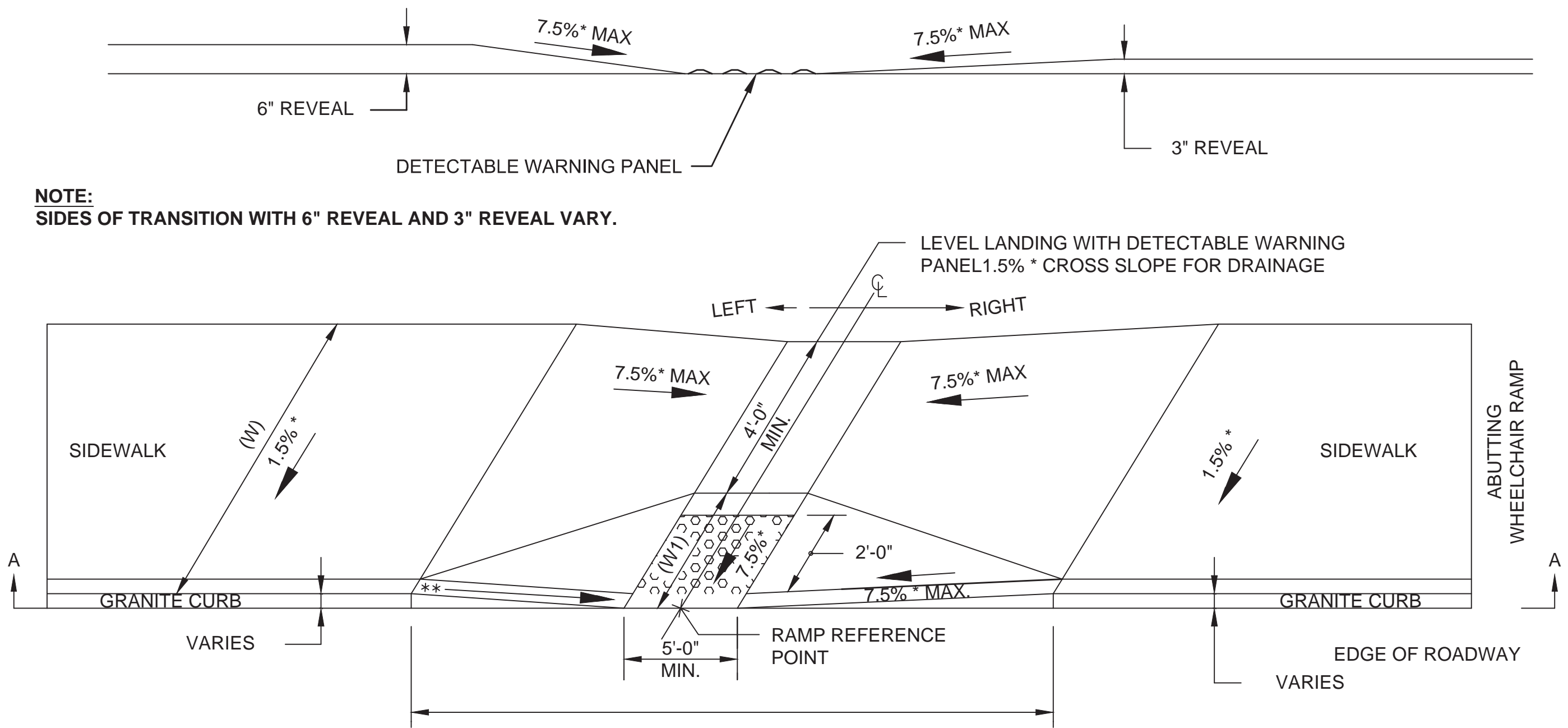
PAVEMENT NOTES (CONT.)

PROPOSED HMA DRIVEWAY

SURFACE: 1-1/2" HOT MIX ASPHALT SURFACE COURSE  
INTERMEDIATE: 2" HOT MIX ASPHALT BINDER COURSE  
BASE: 8" GRAVEL BORROW (TYPE B)

PROPOSED HMA SIDEWALK

SURFACE: 1" HOT MIX ASPHALT SURFACE COURSE  
INTERMEDIATE: 1 1/2" HOT MIX ASPHALT BINDER COURSE  
BASE: 8" GRAVEL BORROW (TYPE B)



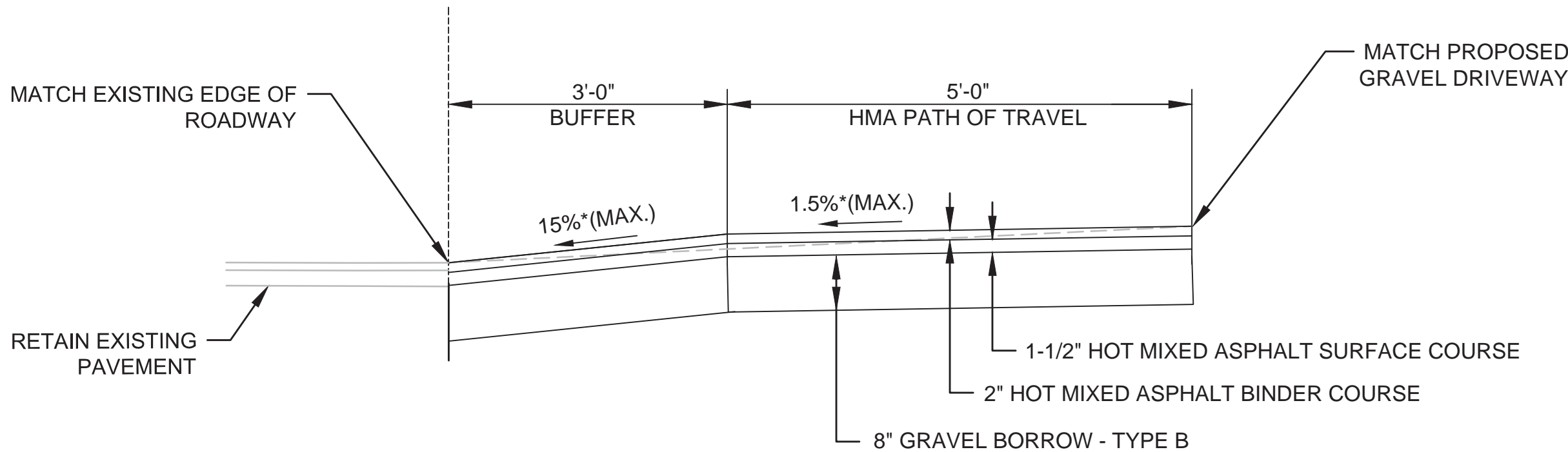
CURB CUT RAMP DETAIL

(LESS THAN 12'-4" SIDEWALK)

NOT TO SCALE

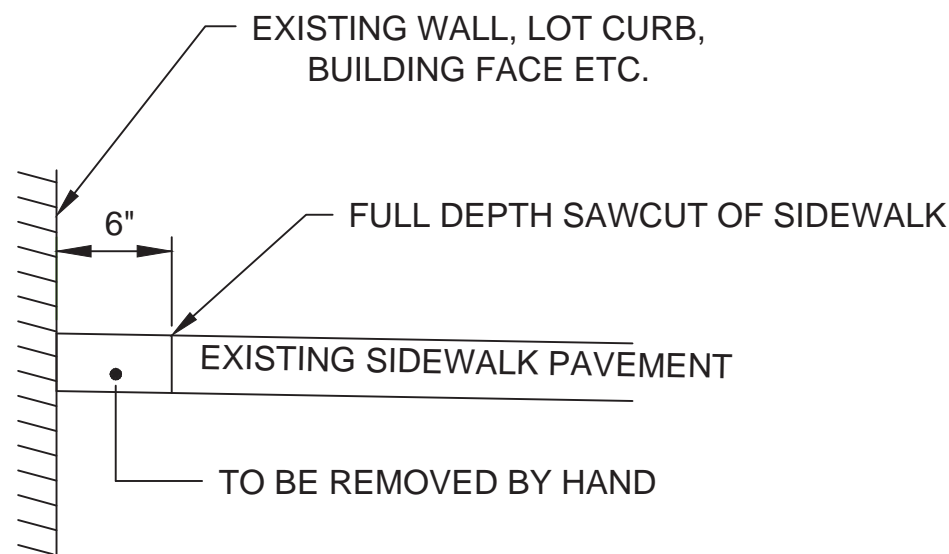
WCR #	BASELINE	RAMP REFERENCE POINT		WIDTH OF RAMP (FT.)	WIDTH OF SIDEWALK (W) (FT.)	TRANSITION LENGTH		3" REVEAL	6" REVEAL
		STATION	OFFSET			LEFT SIDE	RIGHT SIDE		
5	LAKE ST	03+10.56	13.79 LT	5'-0"	10'-0"	6'-6"	5'-6"	RIGHT SIDE	LEFT SIDE
6	LAKE ST	03+11.02	15.93 RT	5'-0"	11'-6"	3'-10"	6'-6"	LEFT SIDE	RIGHT SIDE
8	LAKE ST	03+59.16	38.70 RT	5'-0"	6'-0"	3'-3"	6'-6"	LEFT SIDE	RIGHT SIDE
9	LAKE ST	03+79.08	16.75 RT	5'-0"	11'-0"	NA	3'-3"	RIGHT SIDE	LEFT SIDE
10	LAKE ST	03+78.42	13.63 LT	5'-0"	9'-9"	3'-3"	9'-0"	LEFT SIDE	RIGHT SIDE
12	LAKE ST	03+31.82	36.99 LT	5'-0"	9'-0"	3'-10"	6'-6"	LEFT SIDE	N/A

NOTES:  
\* CONSTRUCTION TOLERANCE ± 0.5%  
- SEE CONSTRUCTION STANDARD E 107.2.0  
\*\* SEE CONSTRUCTION STANDARD E 107.9.0 - DETECTABLE WARNING PANELS SHALL BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STD E 107.6.5  
- CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR CONSTRUCTING RAMPS COMPLIANT WITH ADA/AAB RULES, REGULATIONS AND STANDARDS. CONTRACTOR SHALL VERIFY RAMPS ARE ADA/AAB COMPLIANT BEFORE POURING CEMENT CONCRETE.



RESIDENTIAL DRIVEWAY DETAIL

NOT TO SCALE



SIDEWALK SAWCUT/REMOVAL DETAIL

NOT TO SCALE

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET		
DESIGN SUBMISSION: CONTRACT DOCUMENTS		
DRAWING TITLE: CONSTRUCTION DETAILS		
PREPARED FOR: TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476		
PREPARED BY: GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 GreenIntl.com		
SCALE: AS NOTED		
DATE: 10/11/2019		
PROJECT NO. 17067.015		
DESIGNED BY: JG		
DRAWN BY: JG		
CHECKED BY: SM/WW		
SHEET NO. 05 OF 32		



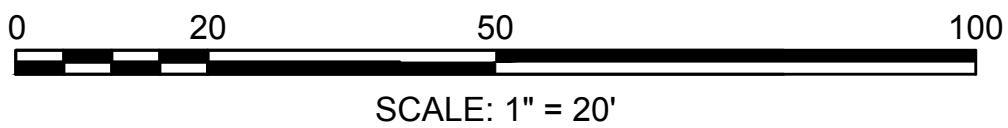
Curve Table				
Curve #	Radius	Length	Tangent	Delta
C1	50.00	9.90	4.967	11°20'43"
C2	50.00	10.20	5.120	11°41'36"
C3	88.00	35.84	18.170	23°19'57"
C4	81.00	33.72	17.110	23°51'20"
C5	81.00	33.72	17.110	23°51'20"
C6	88.00	36.34	18.435	23°39'49"
C7	35.00	2.01	1.007	3°17'42"
C8	35.00	3.28	1.643	5°22'32"
C9	95.00	38.88	19.718	23°27'07"
C10	88.00	36.49	18.510	23°45'27"
C11	88.00	36.49	18.510	23°45'27"
C12	95.00	38.88	19.718	23°27'07"
C13	50.00	9.95	4.993	11°24'17"
C14	50.00	9.95	4.993	11°24'17"
C15	117.00	45.56	23.071	22°18'36"
C16	105.00	40.31	20.408	21°59'53"
C17	107.00	37.30	18.843	19°58'29"
C18	95.00	33.76	17.059	20°21'37"
C19	1.00	2.73	4.734	156°08'40"
C20	1.00	2.73	4.734	156°08'40"
C21	1.00	2.73	4.754	156°14'33"
C22	1.00	2.73	4.754	156°14'33"

Line Table	
Line #	Length
L1	52.63
L2	6.05
L3	58.18
L4	7.85
L5	34.25
L6	11.31
L7	12.70
L8	5.58
L9	7.35
L10	67.17
L11	23.54
L12	6.22
L13	60.39
L14	28.97
L15	6.23
L16	10.60
L17	11.38
L18	14.17
L19	17.78
L20	9.85
L21	16.04

Curve Table				
Curve #	Radius	Length	Tangent	Delta
C23	33.03	57.98	39.762	100°34'06"
C24	37.00	49.24	29.036	76°14'45"
C25	17.00	25.97	16.284	87°32'12"
C26	15.00	24.10	15.550	92°03'43"

LAKE ST CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L200	0+00.00	2972539.715	751413.222		N80°17'27"E 130.43'	1+30.43	2972561.712	751541.782
C200	1+30.43	2972561.712	751541.782	R=200.00' Δ=13°28'55" L=47.06' T=23.64'		1+77.49	2972575.008	751586.812
L201	1+77.49	2972575.008	751586.812		N66°48'32"E 297.51'	4+75.00	2972692.169	751860.287

MINUTEMAN BIKEWAY CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L100	0+00.00	2972373.323	751610.920		N19°19'06"W 115.24'	1+15.24	2972482.073	751572.797
C100	1+15.24	2972482.073	751572.797	R=200.00' Δ=0°42'48" L=2.49' T=1.25'		1+17.73	2972484.428	751571.988
L101	1+17.73	2972484.428	751571.988		N18°36'18"W 182.96'	3+00.69	2972657.824	751513.617
C101	3+00.69	2972657.824	751513.617	R=130.00' Δ=21°45'43" L=49.38' T=24.99'		3+50.06	2972700.546	751489.459
C102	3+50.06	2972700.546	751489.459	R=89.00' Δ=19°59'43" L=31.06' T=15.69'		3+81.12	2972727.208	751473.836
L102	3+81.12	2972727.208	751473.836		N20°22'18"W 28.88'	4+10.00	2972754.279	751463.784



LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION:  
CONTRACT DOCUMENTS

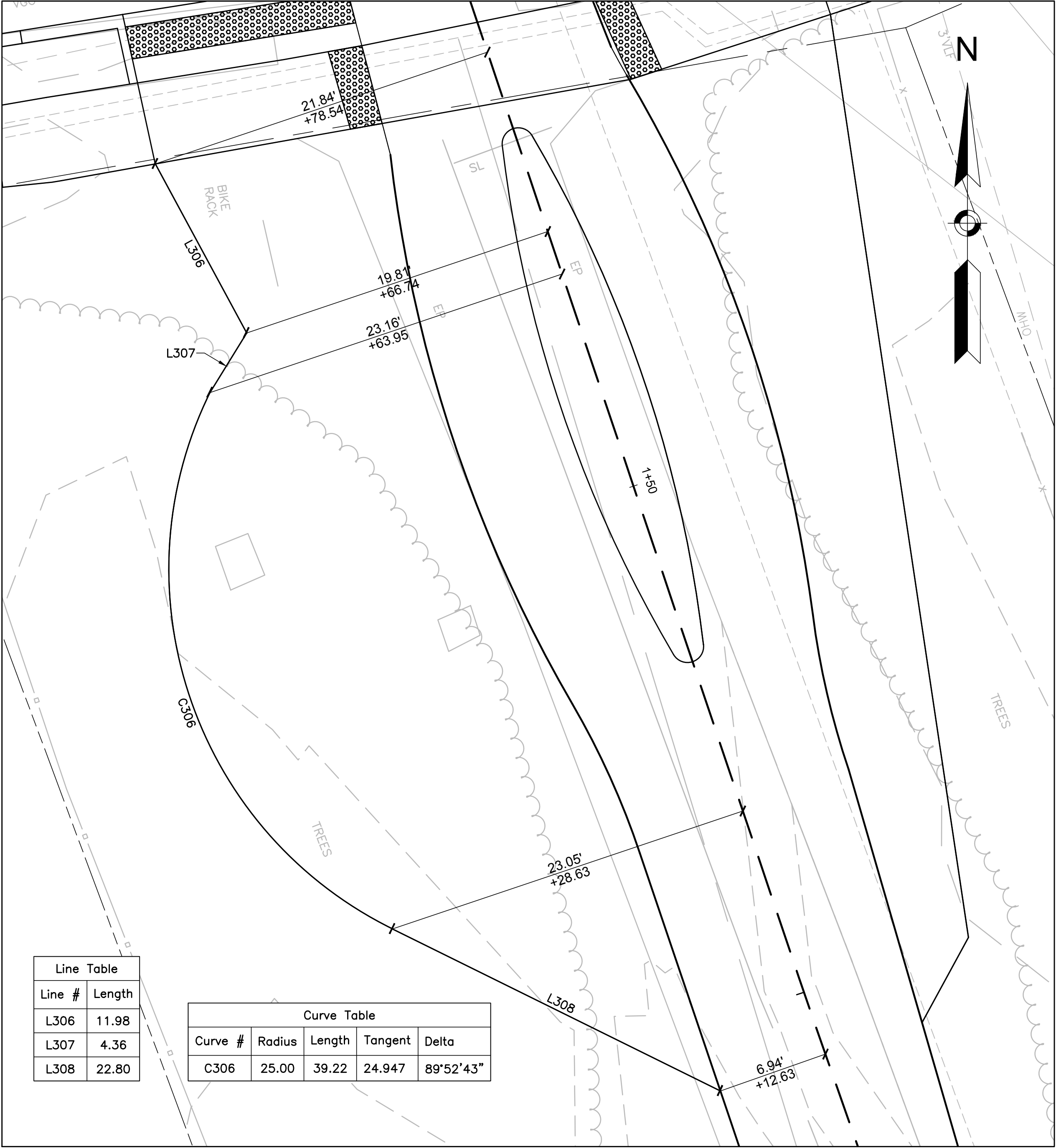
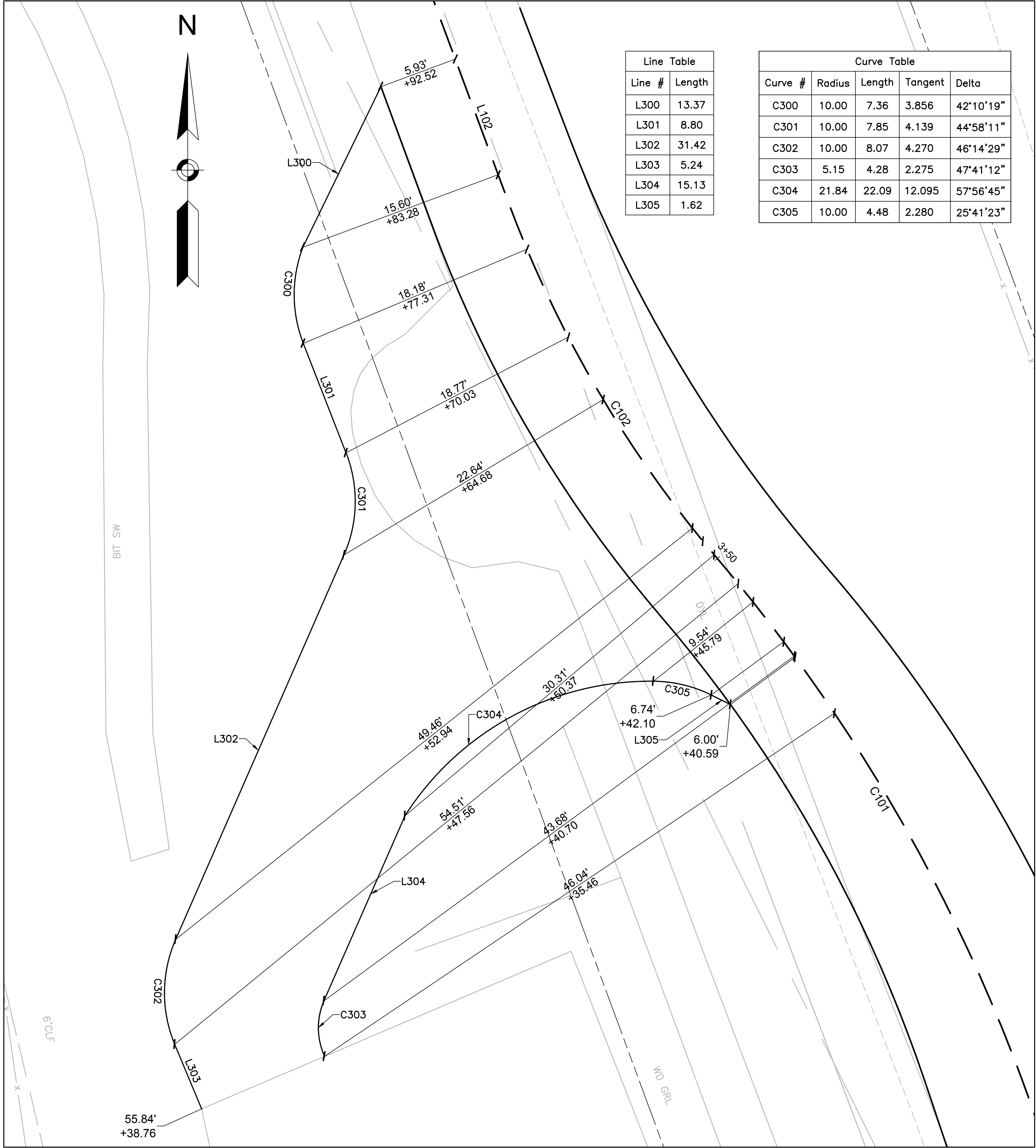
DRAWING TITLE:  
CURB TIE & LAYOUT PLAN

PREPARED FOR:  
 TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

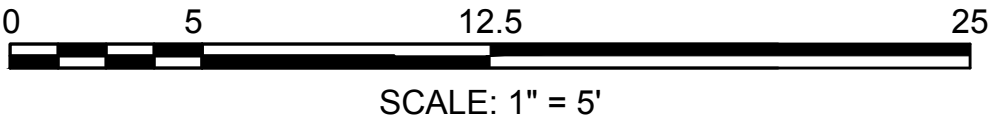
PREPARED BY:  
 GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts (978) 923-0400  
Greenintl.com

SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. <b>06</b> OF <b>32</b>
DATE: 10/11/2019	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: SM/WW	





PLAZA LAYOUT PLAN 2



PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION:  
CONTRACT DOCUMENTS

DRAWING TITLE:  
PLAZA LAYOUT PLAN

PREPARED FOR:  
TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

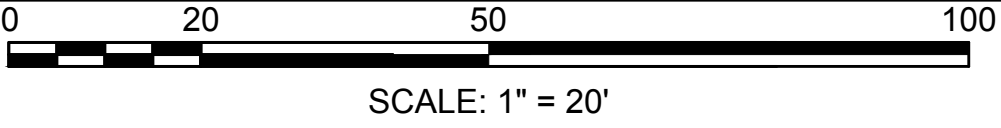
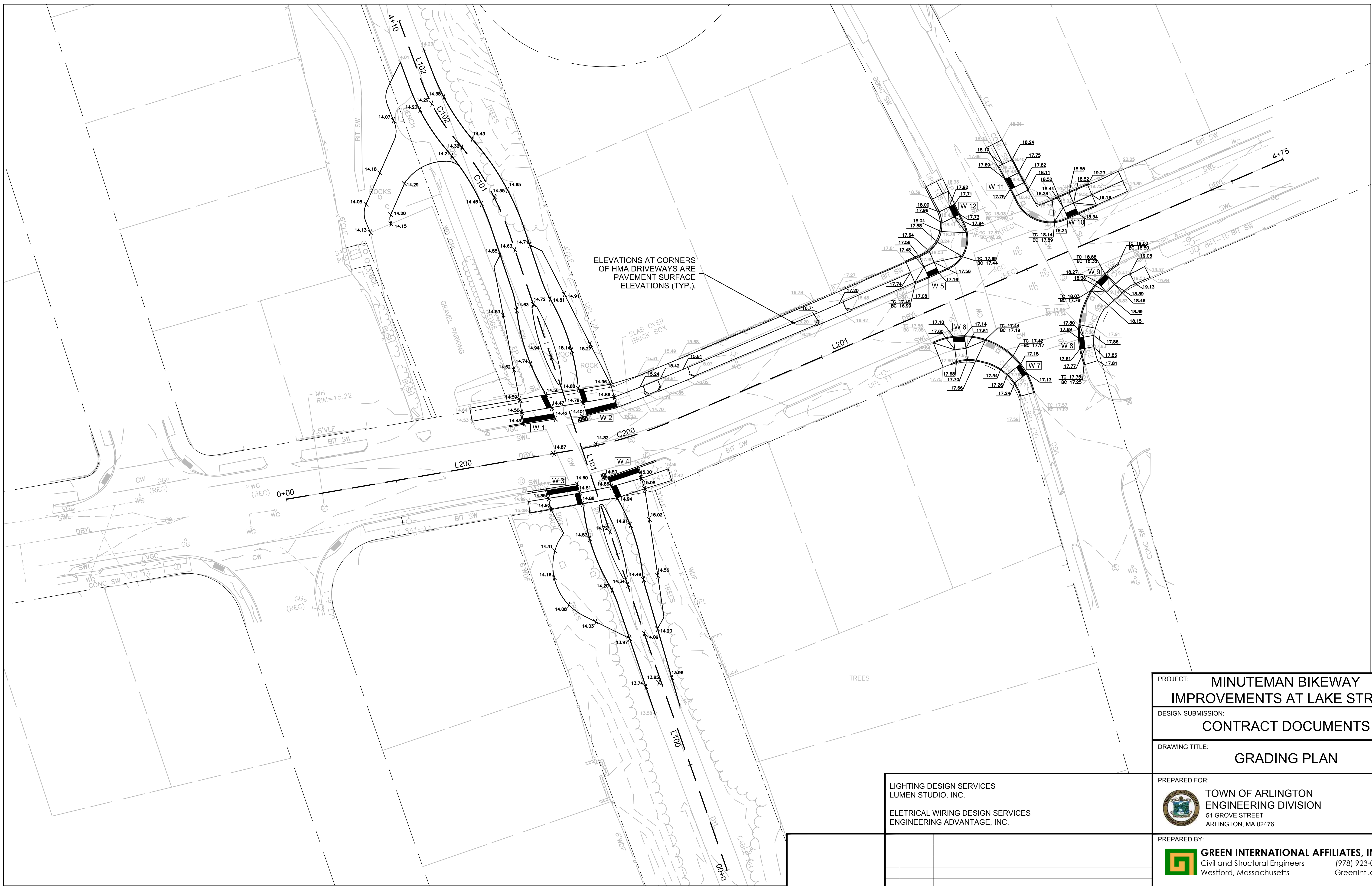
SCALE: AS NOTED  
DATE: 10/11/2019  
PROJECT NO. 17067.015


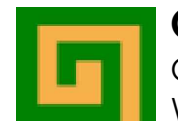
DESIGNED BY: JG  
DRAWN BY: JG  
CHECKED BY: SM/WW

SHEET NO.  
07 OF 32



E:\Projects\2017\17067\DOCUMENT DESIGN\DWG\GRD TEL & GRADING PLAN.dwg, Plotted: 11/20/19, 10:29 AM



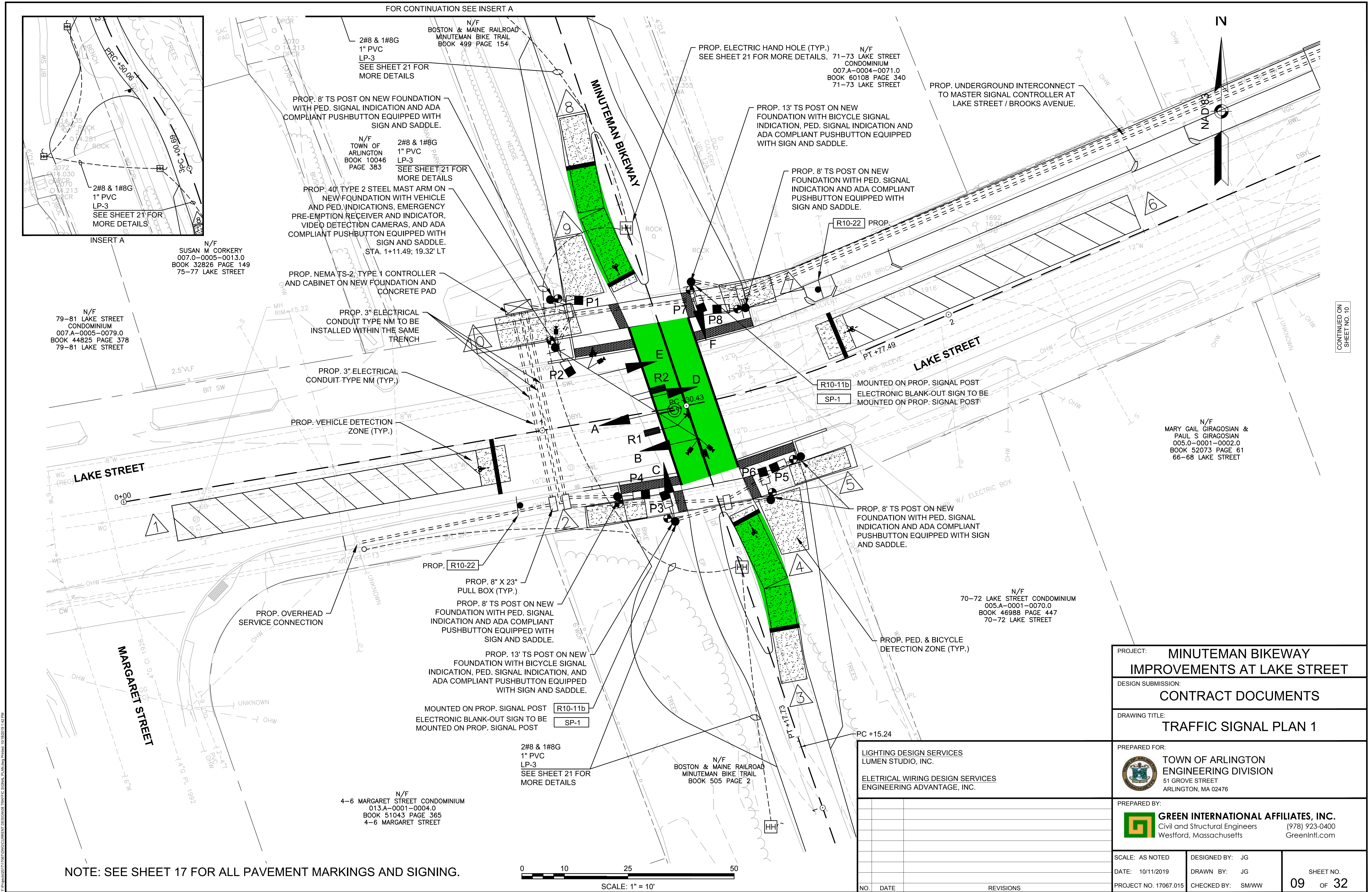
PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET		
DESIGN SUBMISSION: CONTRACT DOCUMENTS		
DRAWING TITLE: GRADING PLAN		
PREPARED FOR:  TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476		
PREPARED BY:  GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 Greenintl.com		
SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 08 OF 32
DATE: 10/11/2019	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: SM/WW	

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS
-----	------	-----------

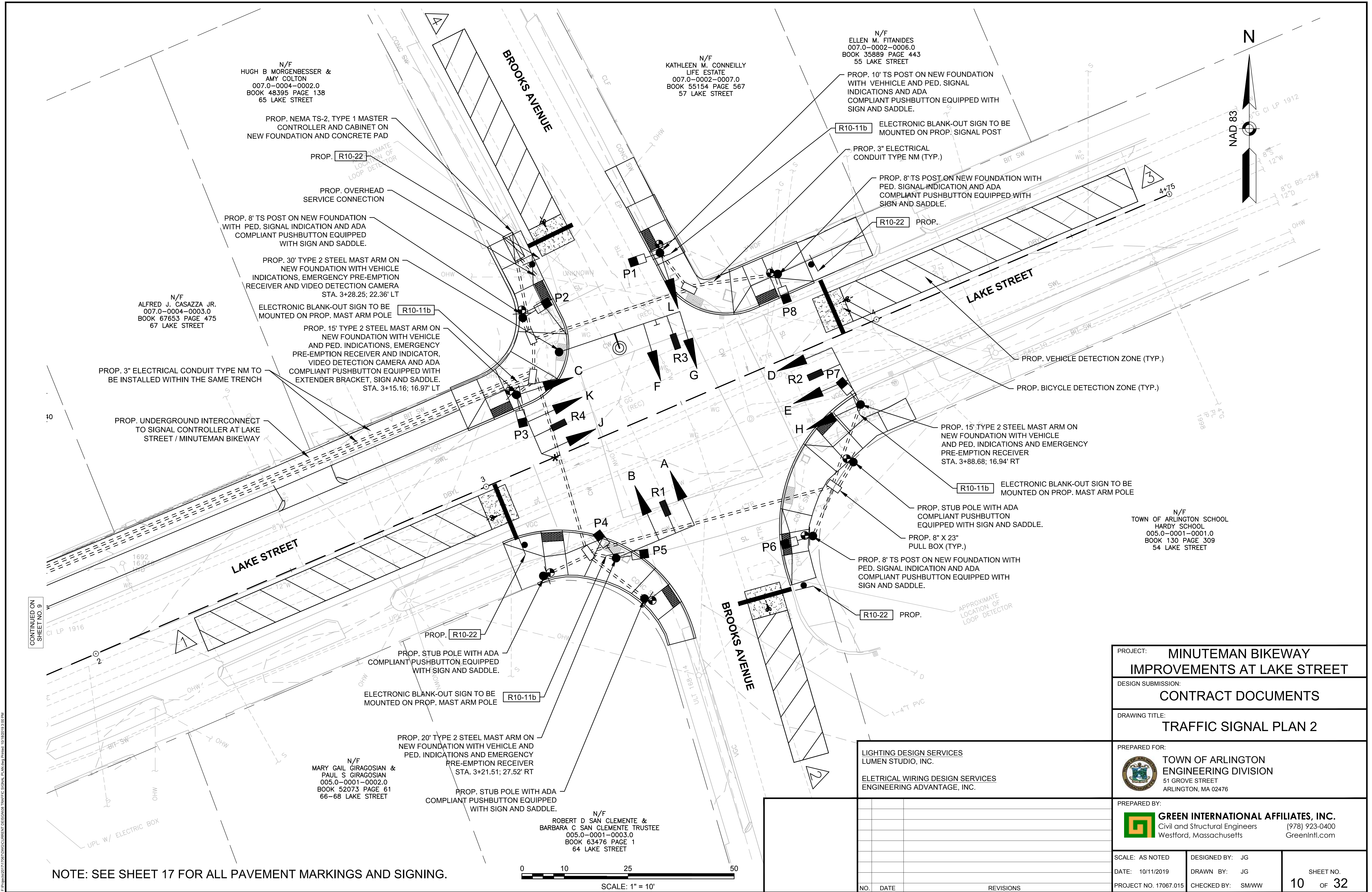




PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET		
DESIGN SUBMISSION: CONTRACT DOCUMENTS		
DRAWING TITLE: TRAFFIC SIGNAL PLAN 1		
PREPARED FOR: TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476		
PREPARED BY: GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 Greenintl.com		
SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 09 OF 32
DATE: 10/11/2019	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: SM/WW	

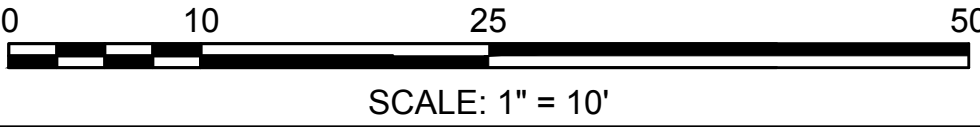
FILE: 17067.015.DWG; CURRENT DESIGN: 08/11/2019; 10:11:20 AM; 10/11/2019 10:11:20 AM


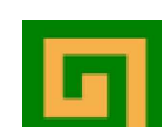




CONTINUED ON  
SHEET NO. 9

NOTE: SEE SHEET 17 FOR ALL PAVEMENT MARKINGS AND SIGNING.



PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET		
DESIGN SUBMISSION: CONTRACT DOCUMENTS		
DRAWING TITLE: TRAFFIC SIGNAL PLAN 2		
PREPARED FOR:  TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476		
PREPARED BY:  GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 Greenintl.com		
SCALE: AS NOTED	DESIGNED BY: JG	SHEET NO. 10 OF 32
DATE: 10/11/2019	DRAWN BY: JG	
PROJECT NO. 17067.015	CHECKED BY: SM/WW	

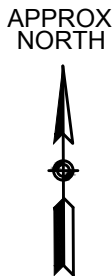





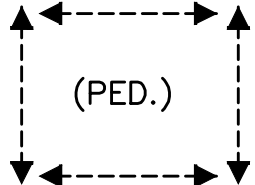


















LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELECTRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.



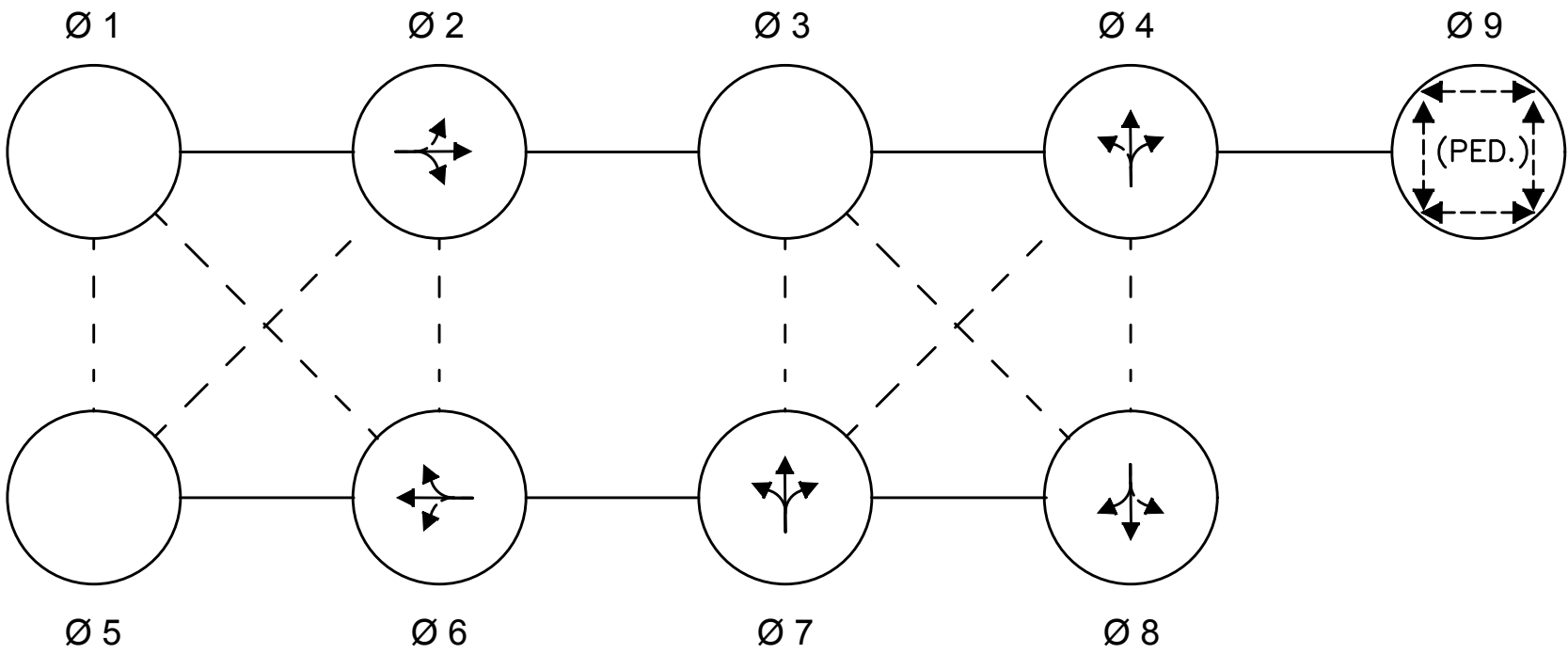




LOCATION 2																								
SEQUENCE & TIMING FOR FULL ACTUATED CONTROL (COORDINATED) LAKE STREET AT BROOKS AVENUE						Ø 2			Ø 4			Ø 6			Ø 7			Ø 8			Ø 9			FLASHING OPERATION
																								
			INTERVALS																					
APPROACH		DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
LAKE STREET		EB	D,E,H	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY		
LAKE STREET		WB	C,J,K	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FY		
BROOKS AVENUE		NB	F																			FR		
BROOKS AVENUE		NB	G,L	R	R	R	G	Y	R	R	R	R	G	Y	R	R	R	R	R	R	R	FR		
BROOKS AVENUE		SB	A,B	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR		
PEDESTRIAN		ALL	P1-P8	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OUT		
TIMING IN SECONDS																								
MINIMUM GREEN (INITIAL)				5			5			5			5			5								
MAX GREEN 1				22.5			18.5			22.5			5.5			8.5								
MAX GREEN 2				31.5			9.5			31.5			-			9.5								
VEHICLE EXTENSION				3			3			3			3			3								
YELLOW CLEARANCE					3.5			3			3.5			3			3							
RED CLEARANCE						1			1.5			1			1.5			1.5						
PED WALK INTERVAL																			7					
PED CLEARANCE INTERVAL																				10	3			
RECALL					SOFT			NONE			SOFT			NONE			NONE			NONE				
DETECTION (MEMORY)					NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			LOCK				
COORDINATION DATA				COORDINATION PHASE TIMING (SEC.)																				
TIMING PLAN		CYCLE LENGTH (SEC.)	REF/OFFSET (SEC.)	Ø 2			Ø 4			Ø 6			Ø 7			Ø 8			Ø 9					
COORDINATION PLAN 1 M-F (6AM-9AM)		70	0	27			23			27			10			13			20					
COORDINATION PLAN 2 M-F (3PM-7PM);		70	0	36			14			36			-			14			20					

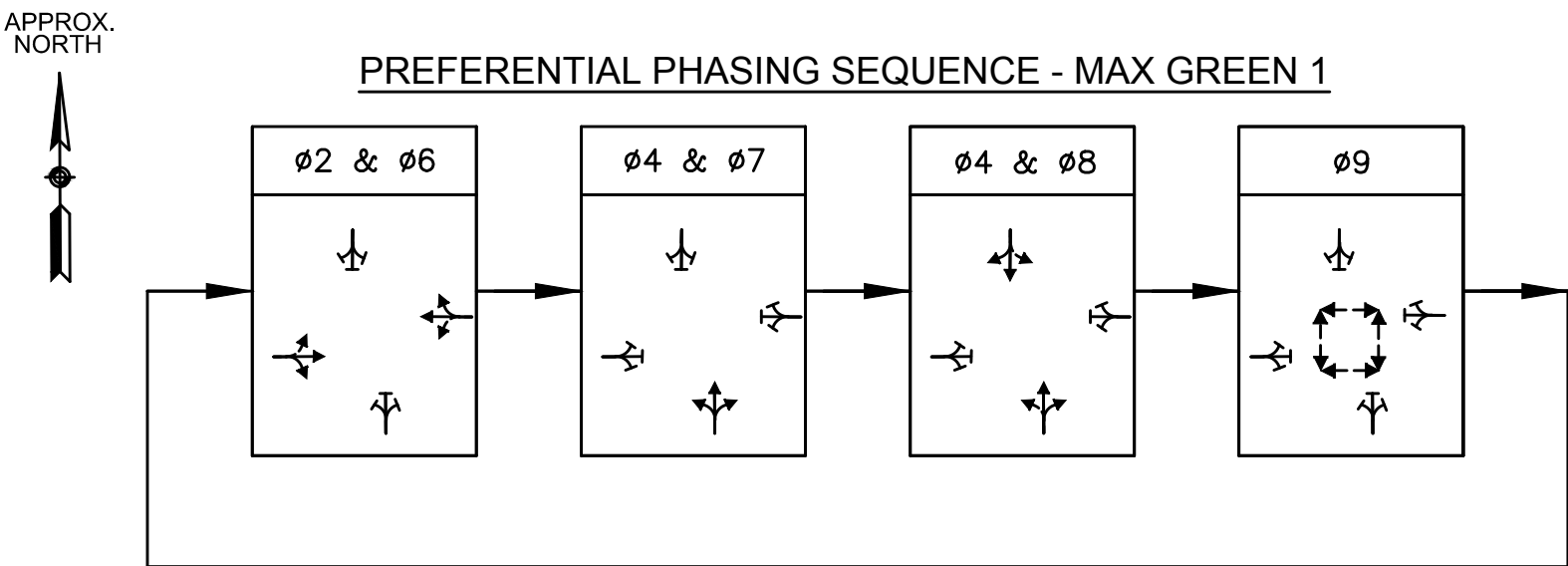
- NOTES:
- STANDARD NEMA CLEARANCES SHALL APPLY.
  - MAXIMUM GREEN 1 SHALL BE IN EFFECT ON WEEKDAYS FROM 6:00AM TO 9:00AM.
  - MAXIMUM GREEN 2 SHALL BE IN EFFECT DURING ALL TIMES EXCEPT AS NOTED ABOVE.
  - SIGNAL SHALL OPERATE UNDER "COORDINATED MODE DURING THE TIMES NOTED ABOVE. THE SIGNAL SHALL OPERATE IN "FREE" MODE DURING ALL OTHER TIMES.

NEMA DUAL RING PHASING NOTES:



- NOTES:
- PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
  - PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
  - THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
  - IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

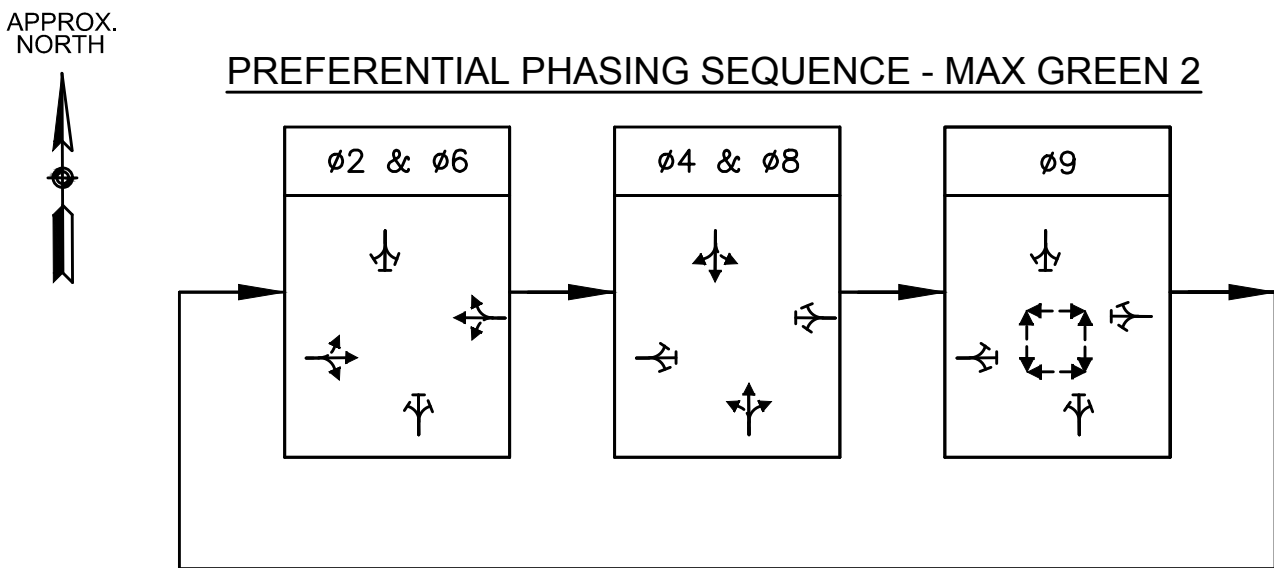
PREFERENTIAL PHASING SEQUENCE - MAX GREEN 1



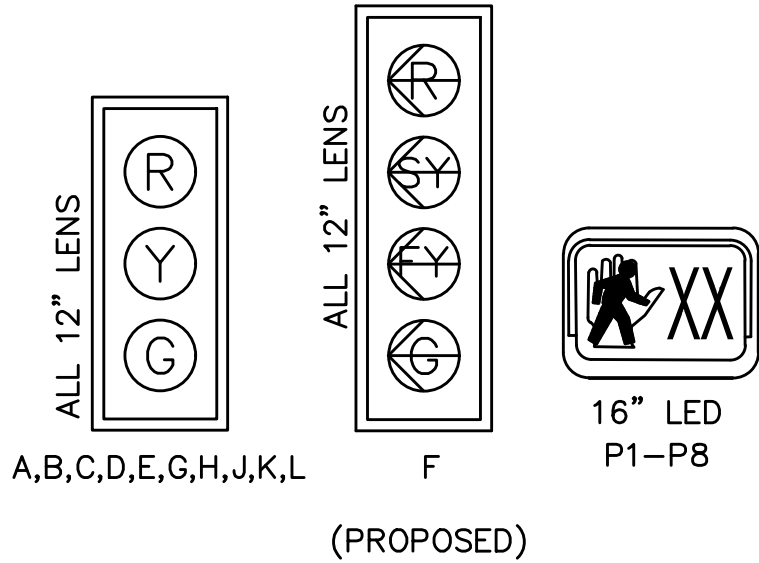
FIRE PRE-EMPTION SCHEDULE				
RECEIVER	PRE-EMPT PHASE ASSIGNMENT	APPROACH AND MOVEMENT	VEHICLE PHASE ASSIGNMENT	NEXT PHASE CALLED
R1	1	SB	Ø 8	Ø 2 + Ø 6
R2	2	EB	Ø 2	Ø 4 + Ø 8
R3	3	NB	Ø 4	Ø 2 + Ø 6
R4	4	WB	Ø 6	Ø 4 + Ø 8

- NOTES:
- EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL RECEIVERS LOCATED AT THE INTERSECTION.
  - PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH RECEIVERS ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (R4, R2, R3, THEN R1)
  - IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL RECEIVER R4 (OR OTHERS AS PROVIDED) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCE PRE-EMPTION THE ASSOCIATED GREEN PHASE FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN PROVIDE PRE-EMPTION PHASE CLEARANCE SERVICE THEN RESUME NORMAL OPERATION.
  - MINIMUM GREEN, NORMAL VEHICLE AND PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
  - ONCE PRE-EMPTION TERMINATES THE SIGNAL WILL RETURN TO PHASES 2+6 TO RESUME NORMAL OPERATION.

PREFERENTIAL PHASING SEQUENCE - MAX GREEN 2



SIGNAL IDENTIFICATION



- NOTES:
- ALL VEHICLE AND BICYCLE LENSES SHALL BE LED TYPE.
  - ALL VEHICLE AND BICYCLE SIGNAL HEADS SHALL BE 12 INCHES.
  - ALL HOUSINGS TO BE PROVIDED WITH TUNNEL VISORS AND 5-INCH NON-LOUVERED BACKPLATES WITH 3-INCH RETROREFLECTIVE BORDER.
  - ALL HOUSINGS TO BE FIXED MOUNTED.
  - ALL SIGNALHEAD BACKPLATES SHALL BE NON-LOUVERED.
  - SIGNAL HEADS D & E SHALL HAVE DISTANCE-LIMITING LOUVERS TO LIMIT THEIR VISIBILITY TO WITHIN 160 FT. UPSTREAM OF THE PROPOSED STOP LINE.

VIDEO DETECTION DATA

DETECTOR NO.	PHASE CALLED	PHASE EXT.	OPERATIONS	DELAY TIME	EXT. TIME
1	Ø2	Ø2	PRESENCE	-	-
2	Ø4	Ø4	PRESENCE	-	-
3	Ø6	Ø6	PRESENCE	-	-
4	Ø8	Ø8	PRESENCE	-	-

LAKE STREET AT BROOKS AVENUE

MAJOR ITEMS LIST

1	SERVICE CONNECTION (OVERHEAD)
1	MASTER SIGNAL CONTROLLER NEMA 8 PHASE TS-2 (TYPE-1), CAB. & FDN
2	15 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
1	20 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
1	30 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN
3	STUB POLE W/ FOUNDATION
3	SIGNAL POLE AND BASE STANDARD, 8 FT. W / FOUNDATION
1	SIGNAL POLE AND BASE STANDARD, 10 FT. W / FOUNDATION
10	12 INCH 1 WAY 3-SECTION LED VEHICLE SIGNAL INDICATION
1	12 INCH 1 WAY 4-SECTION LED VEHICLE SIGNAL INDICATION (ALL ARROWS)
8	16 INCH LED PEDESTRIAN INDICATION WITH COUNTDOWN
8	PED. PUSH BUTTON W/ SIGN AND SADDLE (ADA COMPLIANT)
1	VIDEO DETECTION SYSTEM
5	8" X 23" PULLBOX
1	PRE-EMPTION PHASE SELECTOR MODULE FOUR-CHANNEL
1	PRE-EMPTION CARD RACK
1	PRE-EMPTION INDICATOR (STROBE) LIGHT
4	PRE-EMPTION RECEIVER (DETECTOR) ONE-WAY
ALL CABLE, LABOR, MISCELLANEOUS MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE INSTALLATION OF A FULLY OPERATIONAL SIGNAL SYSTEM AS INTENDED ON TRAFFIC SIGNAL PLAN (SHEET 10).	

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION: CONTRACT DOCUMENTS

DRAWING TITLE: SEQUENCE AND TIMING PLAN 2

PREPARED FOR:  
  
TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
  
GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

SCALE: AS NOTED  
DATE: 10/11/2019  
PROJECT NO. 17067.015

DESIGNED BY: JG  
DRAWN BY: JG  
CHECKED BY: SM/WW


SHEET NO.  
12 OF 32

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.  
ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

NO. DATE REVISIONS





 **massDOT**  
Department of Transportation  
Highway Division

STANDARD DRAWINGS

OVERHEAD SIGNAL STRUCTURE & FOUNDATION

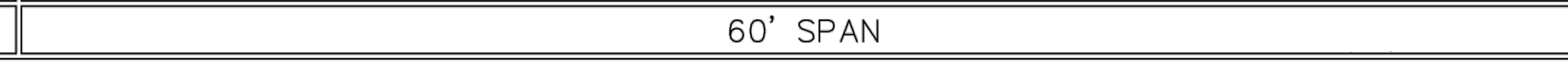
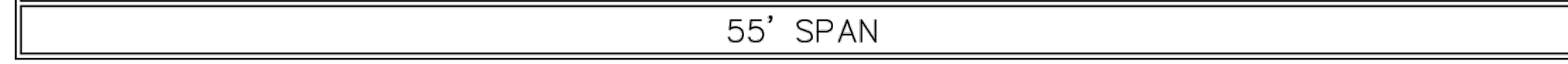
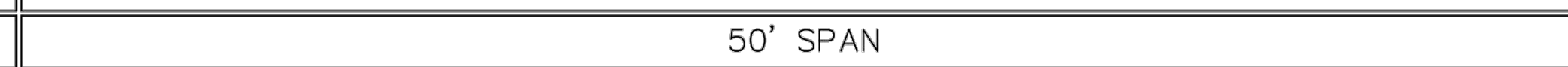
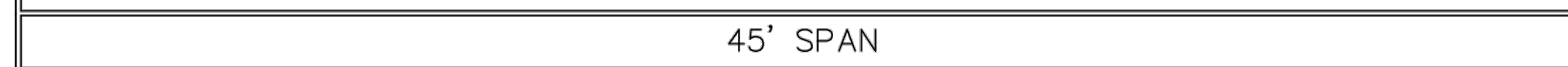
15' – 40' ARM  
LOAD DIAGRAMS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION  
HIGHWAY DIVISION  
10 PARK PLAZA BOSTON, MASS

DECEMBER, 2015

[illegible]





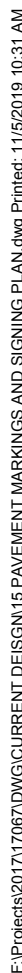







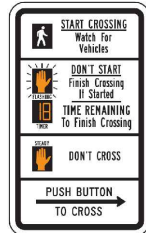


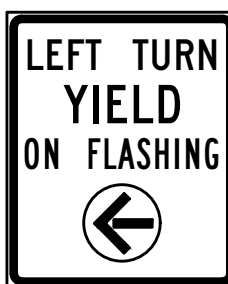
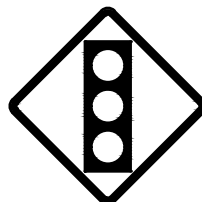




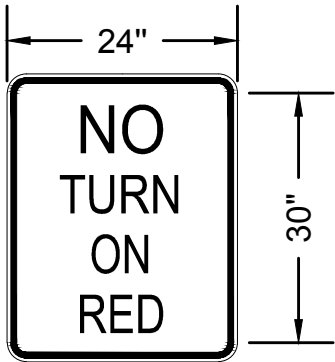




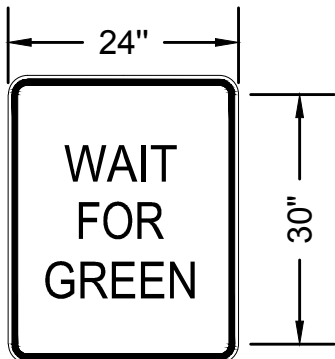
TRAFFIC SIGN SUMMARY

IDENTIFI- CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NO. REQ'D.	UNIT AREA IN SQUARE FEET	TOTAL AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK- GROUND	LEGEND	BORDER			
R9-7	12"	18"		SEE MUTCD STANDARDS			2	SEE MUTCD STANDARDS			P5 2	1.50	3.00
R10-3e	9"	15"					16				P5 0 MOUNTED OVER PUSH- BUTTONS	0.94	15.04
R10-22	12"	18"					6				P5 6	1.50	9.00
R10-10b	12"	18"		SEE MUTCD INTERIM APPROVAL FOR OPTIONAL USE OF A BICYCLE SIGNAL FACE (IA-16)			2	SEE MUTCD INTERIM APPROVAL FOR OPTIONAL USE OF A BICYCLE SIGNAL FACE (IA-16)			P5 0 2 MOUNTED ON PROP. SIGNAL POSTS		6.00
MA-R10-12a	30"	36"		SEE MASSDOT STANDARD SIGNS			1	WHITE	BLACK / YELLOW	BLACK	P5 0 MOUNTED ON MAST ARM	3.00	7.50
W3-3	18"	18"		SEE MUTCD STANDARDS			2	SEE MUTCD STANDARDS			P5 2	2.86	4.50
NOTES:  SEE THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ITS REVISIONS, THE 2012 MASSACHUSETTS												45.04	

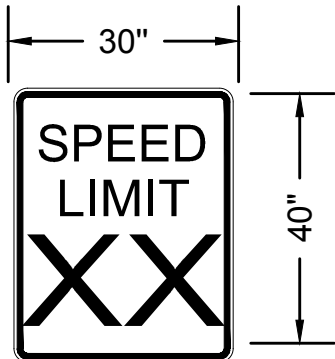
ELECTRONIC BLANK-OUT SIGNS



R10-11b



SP-1

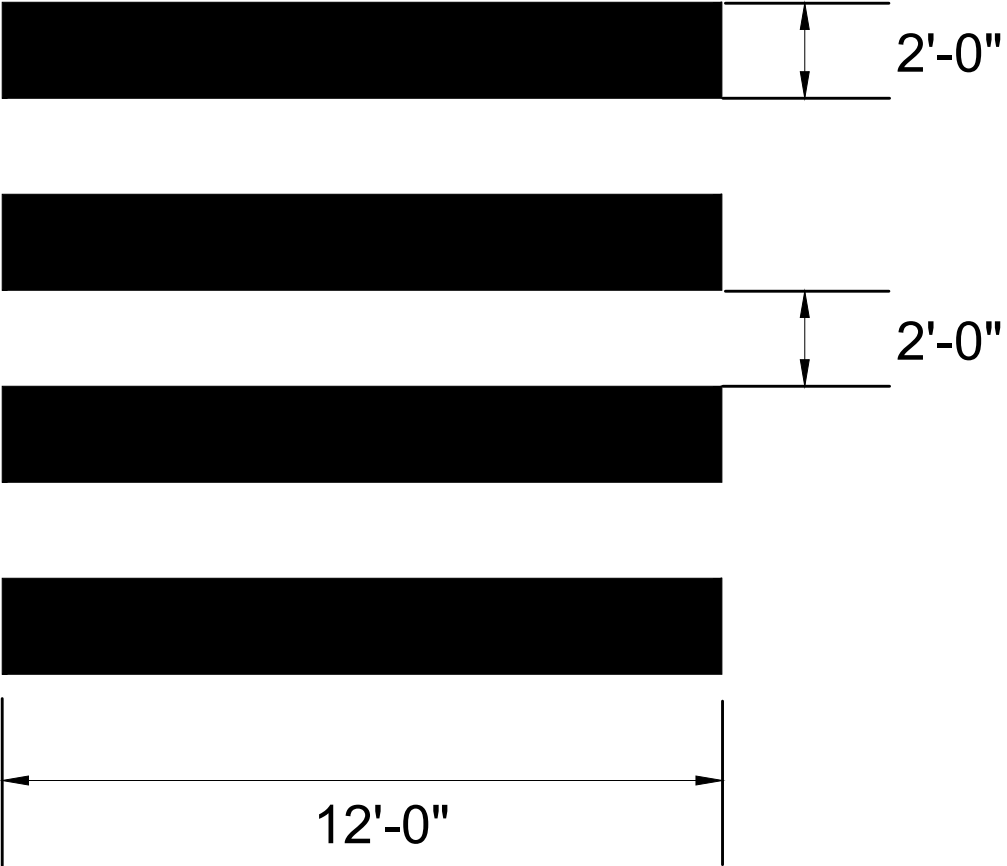


R2-1

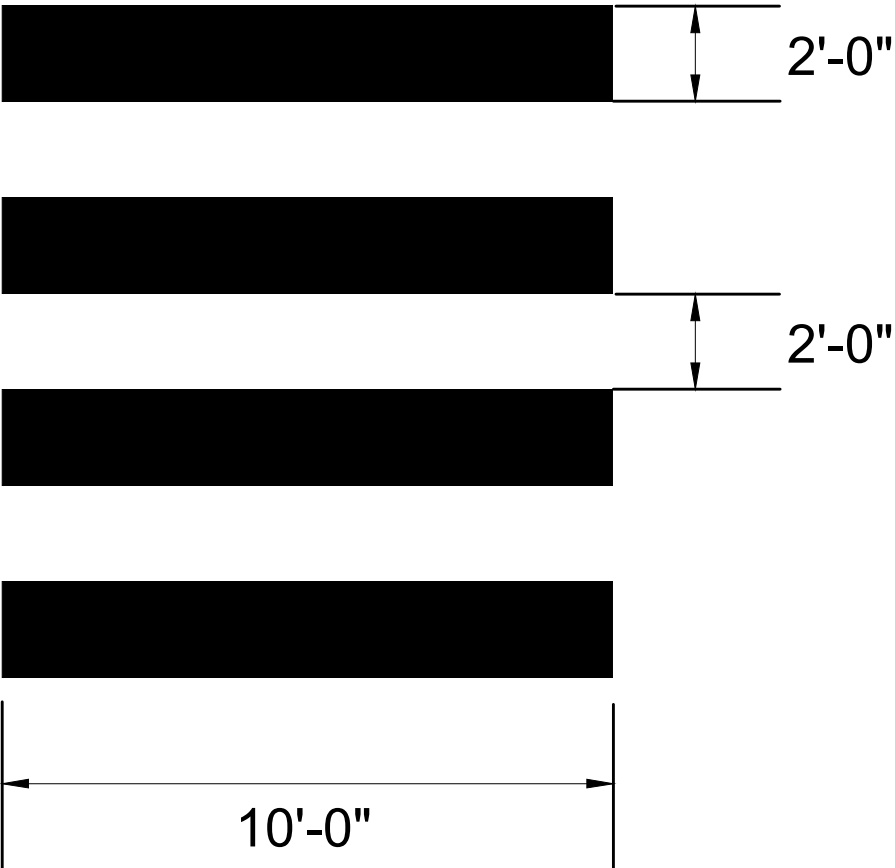
NOTES:

- "NO TURN ON RED" AND "WAIT FOR GREEN" ELECTRONIC BLANK-OUT SIGNS TO BE INCLUDED IN THE LUMP SUM BID PRICE.
- VARIABLE SPEED LIMIT SIGN (R2-1) TO BE INCLUDED IN THE LUMP SUM BID PRICE.
- ALL PROPOSED R10-11b ELECTRONIC BLANK-OUT SIGNS AT THE LAKE STREET / BROOKS AVENUE SIGNALIZED INTERSECTION SHALL BE BLANK AT ALL TIMES EXCEPT WHEN THE EXCLUSIVE PEDESTRIAN PHASE IS ACTIVATED. DURING THE EXCLUSIVE PEDESTRIAN SIGNAL PHASE, ALL R10-11b ELECTRONIC BLANK-OUT SIGNS SHALL READ "NO TURN ON RED" AS SHOWN IN THE ABOVE DETAIL.
- ALL PROPOSED SP-1 ELECTRONIC BLANK-OUT SIGNS SHALL BE BLANK AT ALL TIMES EXCEPT WHEN A BICYCLE IS DETECTED ALONG THE MINUTEMAN BIKEWAY APPROACHING LAKE STREET. WHEN A BICYCLE IS DETECTED ALONG A MINUTEMAN BIKEWAY APPROACH, THE CORRESPONDING SP-1 ELECTRONIC BLANK-OUT SIGN SHALL READ "WAIT FOR GREEN", AS SHOWN IN THE ABOVE DETAIL, UNTIL THE MINUTEMAN BIKEWAY APPROACH RECEIVES A GREEN LIGHT.
- SEE SPECIAL PROVISIONS FOR ELECTRONIC BLANK-OUT AND VARIABLE SPEED LIMIT SIGN SPECIFICATIONS, RESPECTIVELY.



PEDESTRIAN CROSSWALK DETAIL  
LAKE STREET AT MINUTEMAN BIKEWAY



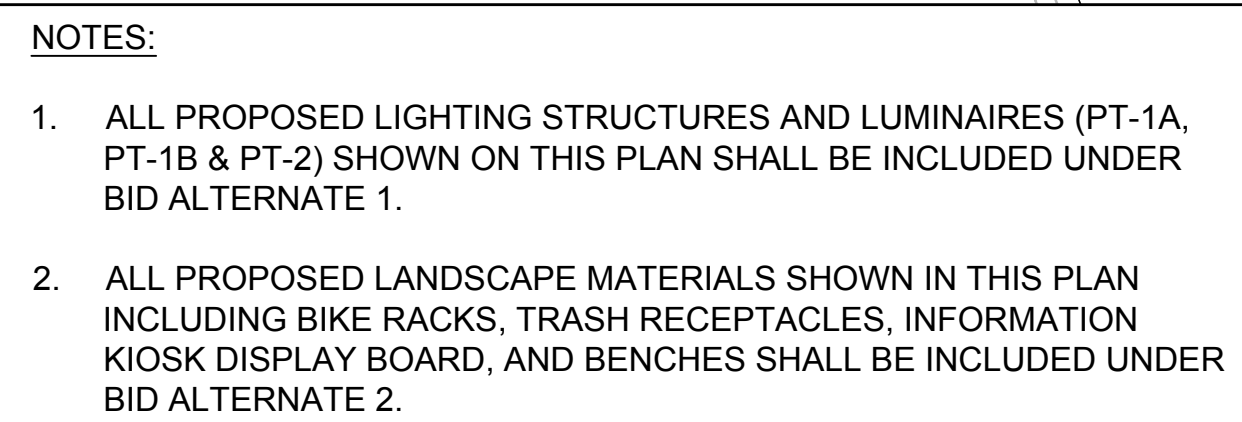
PEDESTRIAN CROSSWALK DETAIL  
LAKE STREET AT BROOKS AVENUE





E:\Projects\2021\1706\DOCUMENTS\DESIGNS\TRAFFIC SIGN SUMMARY.dwg Plot: 11/20/2021 1:54 PM

PROJECT: MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET		
DESIGN SUBMISSION: CONTRACT DOCUMENTS		
DRAWING TITLE: TRAFFIC SIGN SUMMARY		
PREPARED FOR:  TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476		
PREPARED BY:  GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 Greenintl.com		
SCALE: AS NOTED		DESIGNED BY: JG
DATE: 10/11/2019		DRAWN BY: JG
PROJECT NO. 17067.015		CHECKED BY: SM/WW
NO. DATE		REVISIONS
18		OF 32

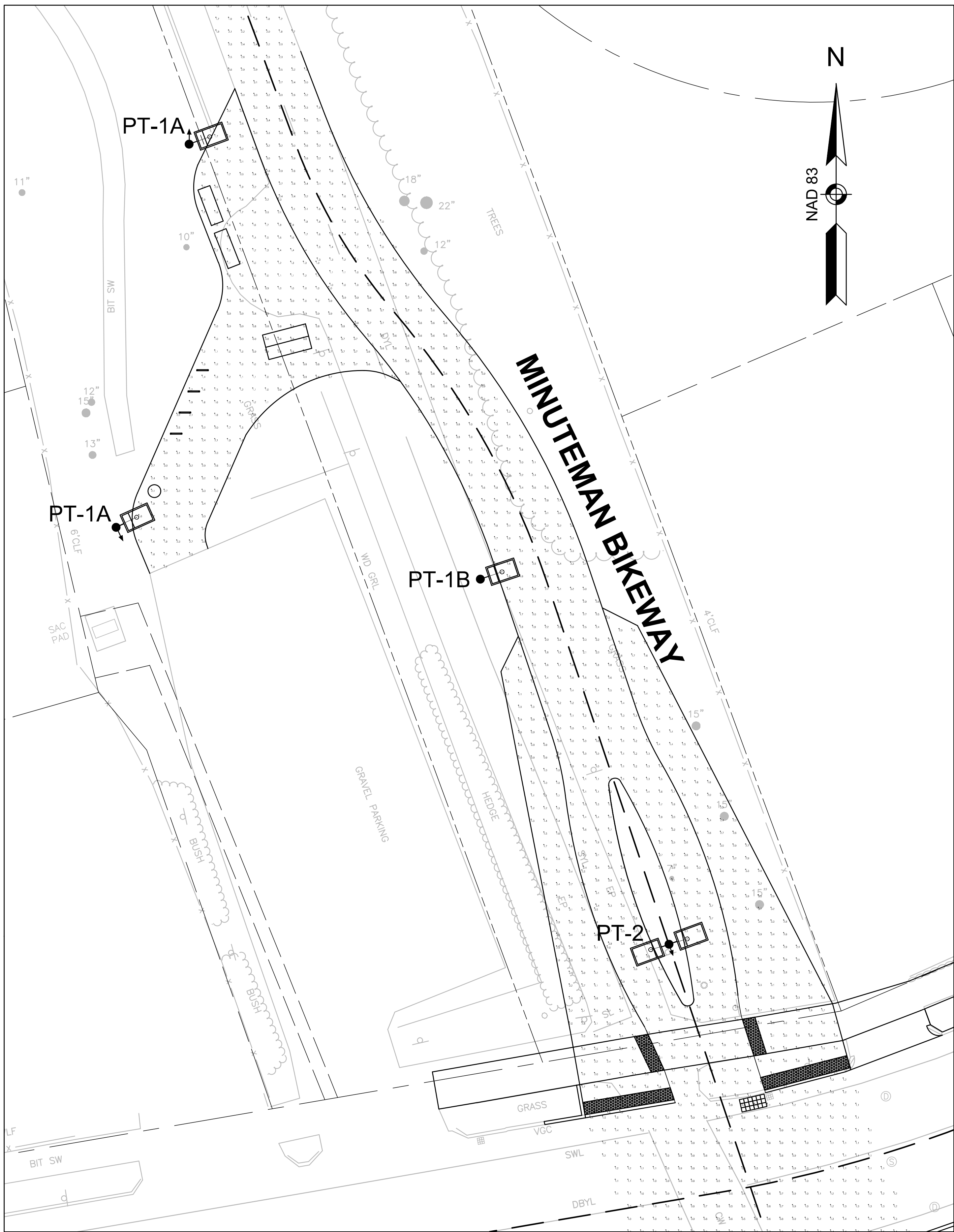




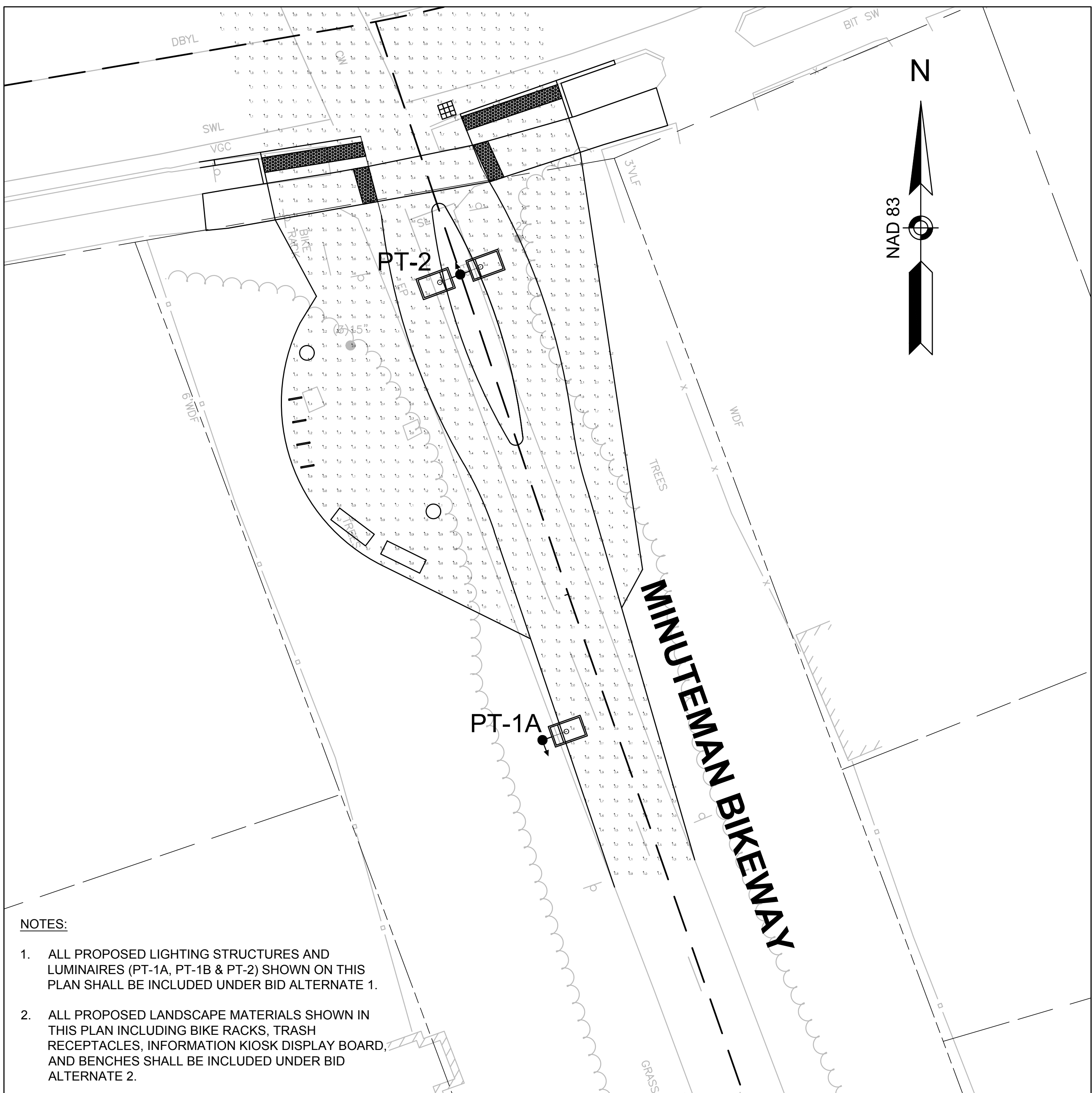
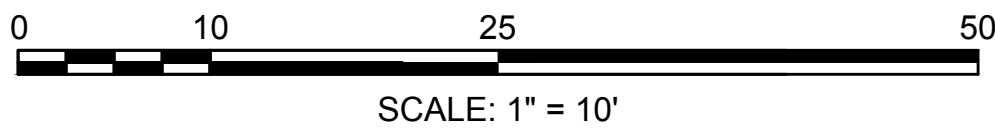
	<p><u>LIGHTING DESIGN SERVICES</u> LUMEN STUDIO, INC.</p> <p>ELETRICAL WIRING DESIGN SERVICES ENGINEERING ADVANTAGE, INC.</p>		<p>PREPARED FOR:</p>  <p>TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476</p>	
			<p>PREPARED BY:</p>  <p><b>GREEN INTERNATIONAL AFFILIATES, INC.</b> Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 GreenIntl.com</p>	
			SCALE: AS NOTED	DESIGNED BY: LS
			DATE: 10/11/2019	DRAWN BY: LS
			PROJECT NO. 17067.015	CHECKED BY: LS
			SHEET NO. <b>19</b> OF <b>32</b>	
	NO.	DATE	REVISIONS	



EP:06/20/2017 17:05:00 CURRENT DESIGN:03 LIGHTING PLAN:06/20/2017 17:05:00 06/11/2019 13:37 PM



Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
⊙	4	PT-1	SINGLE	N.A.	0.400	BPL-X-R2-5G140-30-XX-UNV
⊙	2	PT-2	BACK-BACK	N.A.	0.400	BPL-X-R2-5G140-30-XX-UNV



NOTES:

- ALL PROPOSED LIGHTING STRUCTURES AND LUMINAIRES (PT-1A, PT-1B & PT-2) SHOWN ON THIS PLAN SHALL BE INCLUDED UNDER BID ALTERNATE 1.
- ALL PROPOSED LANDSCAPE MATERIALS SHOWN IN THIS PLAN INCLUDING BIKE RACKS, TRASH RECEPTACLES, INFORMATION KIOSK DISPLAY BOARD, AND BENCHES SHALL BE INCLUDED UNDER BID ALTERNATE 2.

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Crosswalk Top	Illuminance	Fc	1.03	1.8	0.4	2.58	4.50
North Bike Path Top	Illuminance	Fc	1.78	4.0	0.2	8.90	20.00
North Seating Area Top	Illuminance	Fc	1.61	3.4	0.5	3.22	6.80
Northeast Pull-Off Top	Illuminance	Fc	2.36	4.2	1.2	1.97	3.50
Northwest Pull-Off Top	Illuminance	Fc	2.30	4.2	0.9	2.56	4.67
South Bike Path Top	Illuminance	Fc	2.21	3.9	0.8	2.76	4.88
South Pull-Off Top	Illuminance	Fc	2.53	4.3	1.3	1.95	3.31
South Seating Area Top	Illuminance	Fc	1.86	4.2	0.7	2.66	6.00

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION:  
CONTRACT DOCUMENTS

DRAWING TITLE: LIGHTING PHOTOMETRICS  
PLAN - BID ALTERNATE 1

PREPARED FOR:  
 TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
 GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

SCALE: AS NOTED

DATE: 10/11/2019

PROJECT NO. 17067.015

DESIGNED BY: LS

DRAWN BY: LS

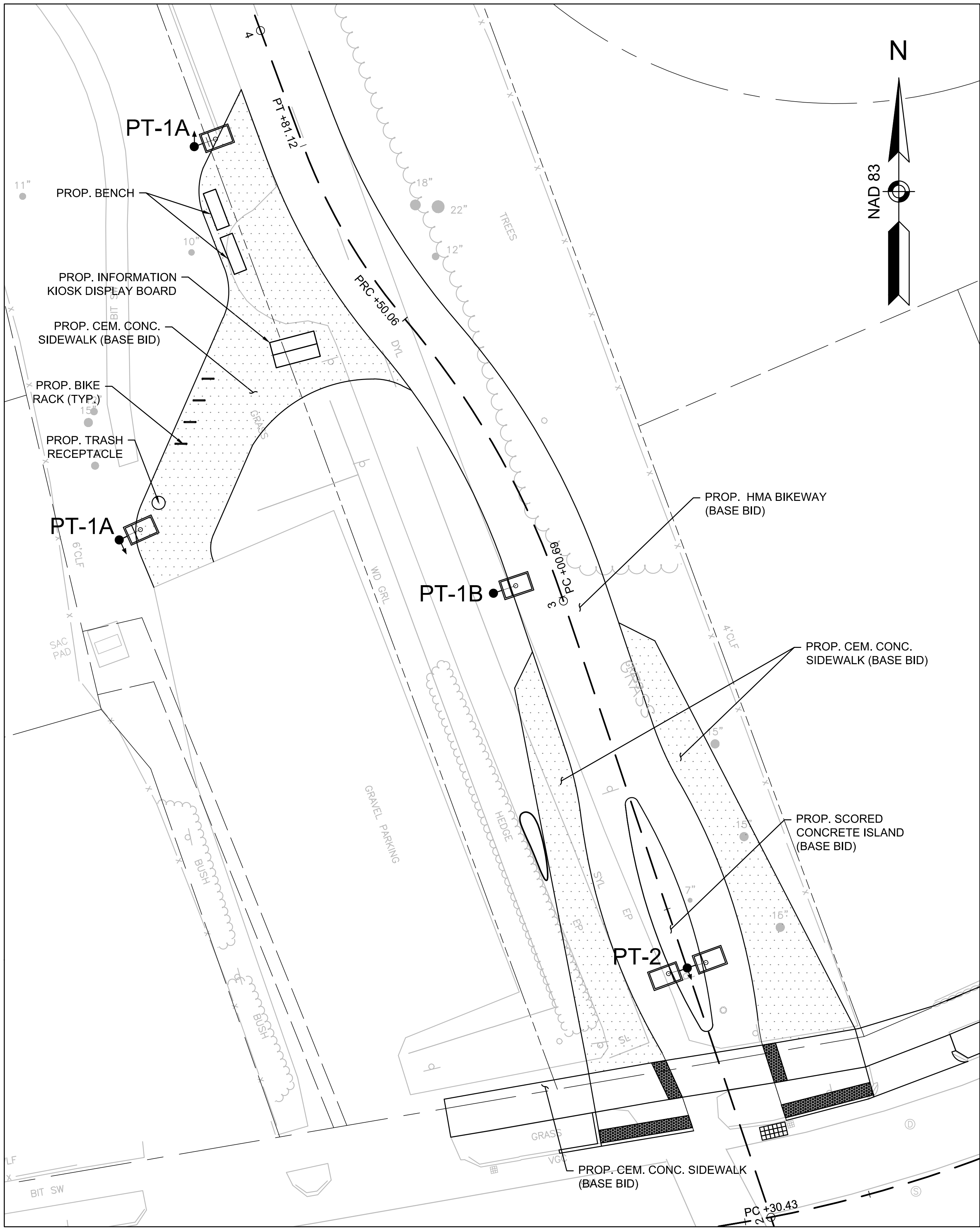
CHECKED BY: LS

SHEET NO.  
20 OF 32

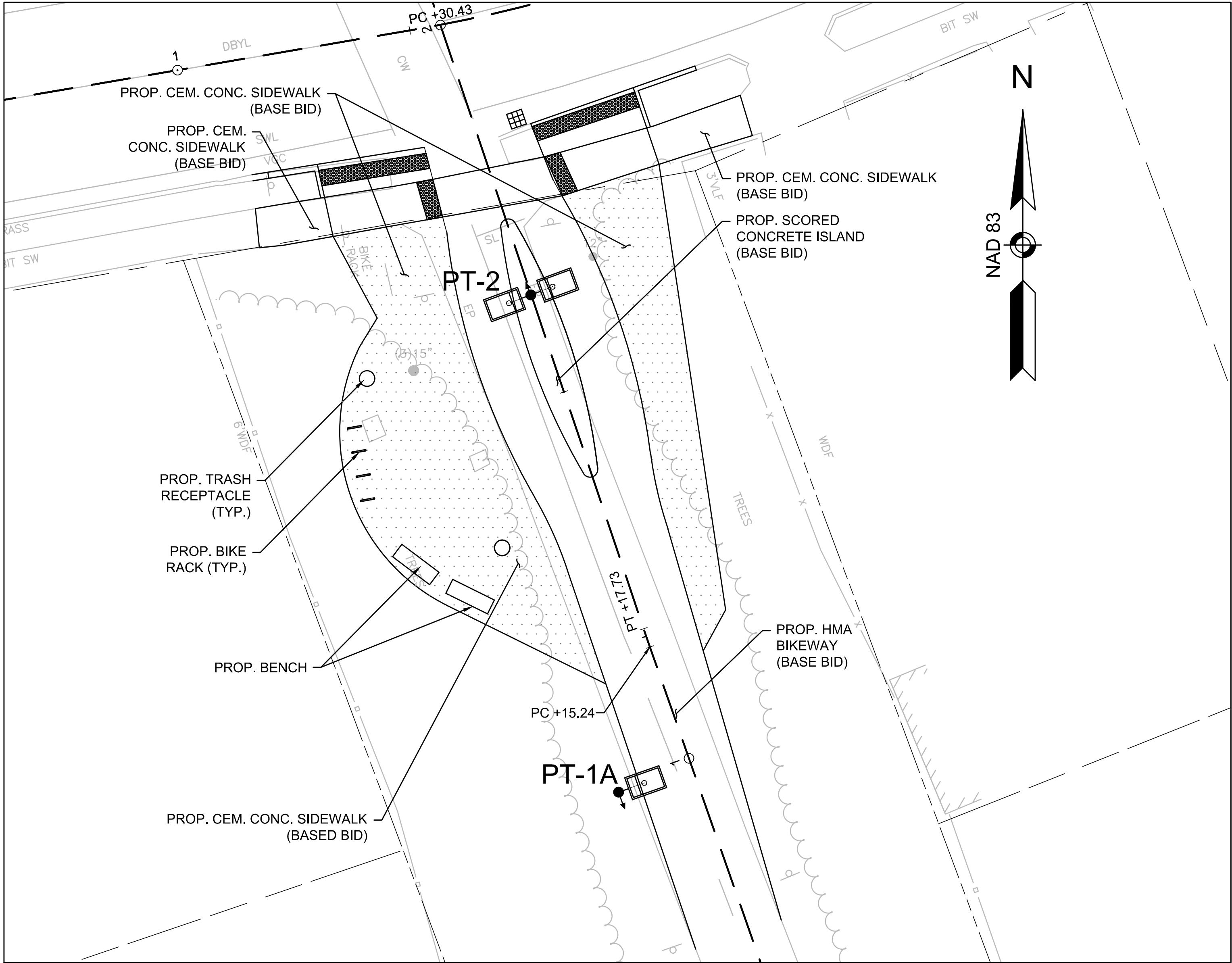








1 MATERIALS AND LAYOUT PLAN NORTH OF LAKE STREET



2 MATERIALS AND LAYOUT PLAN SOUTH OF LAKE STREET

NOTES:

1. ALL PROPOSED LANDSCAPE MATERIALS SHOWN IN THIS PLAN INCLUDING BIKE RACKS, TRASH RECEPTACLES, INFORMATION KIOSK DISPLAY BOARD AND BENCHES SHALL BE INCLUDED UNDER BID ALTERNATE 2.
2. ALL PROPOSED LIGHTING STRUCTURES AND LUMINAIRES (PT-1A, PT-1B & PT-2) SHOWN ON THIS PLAN SHALL BE INCLUDED UNDER BID ALTERNATE 1,

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.  
ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

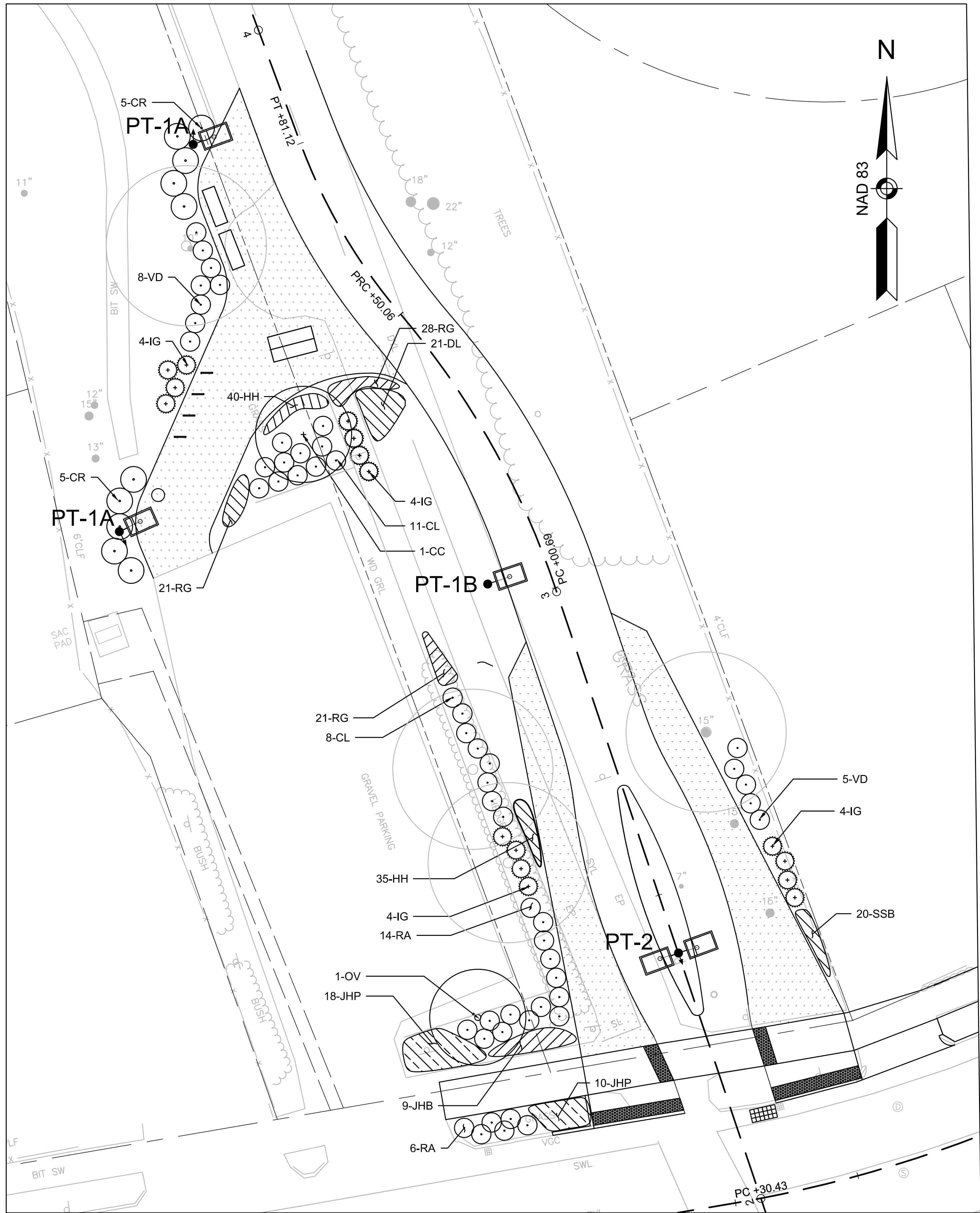
PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET  
DESIGN SUBMISSION:  
CONTRACT DOCUMENTS  
DRAWING TITLE: LANDSCAPE MATERIALS  
AND LAYOUT PLAN - BID ALTERNATE 2

PREPARED FOR:  
TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

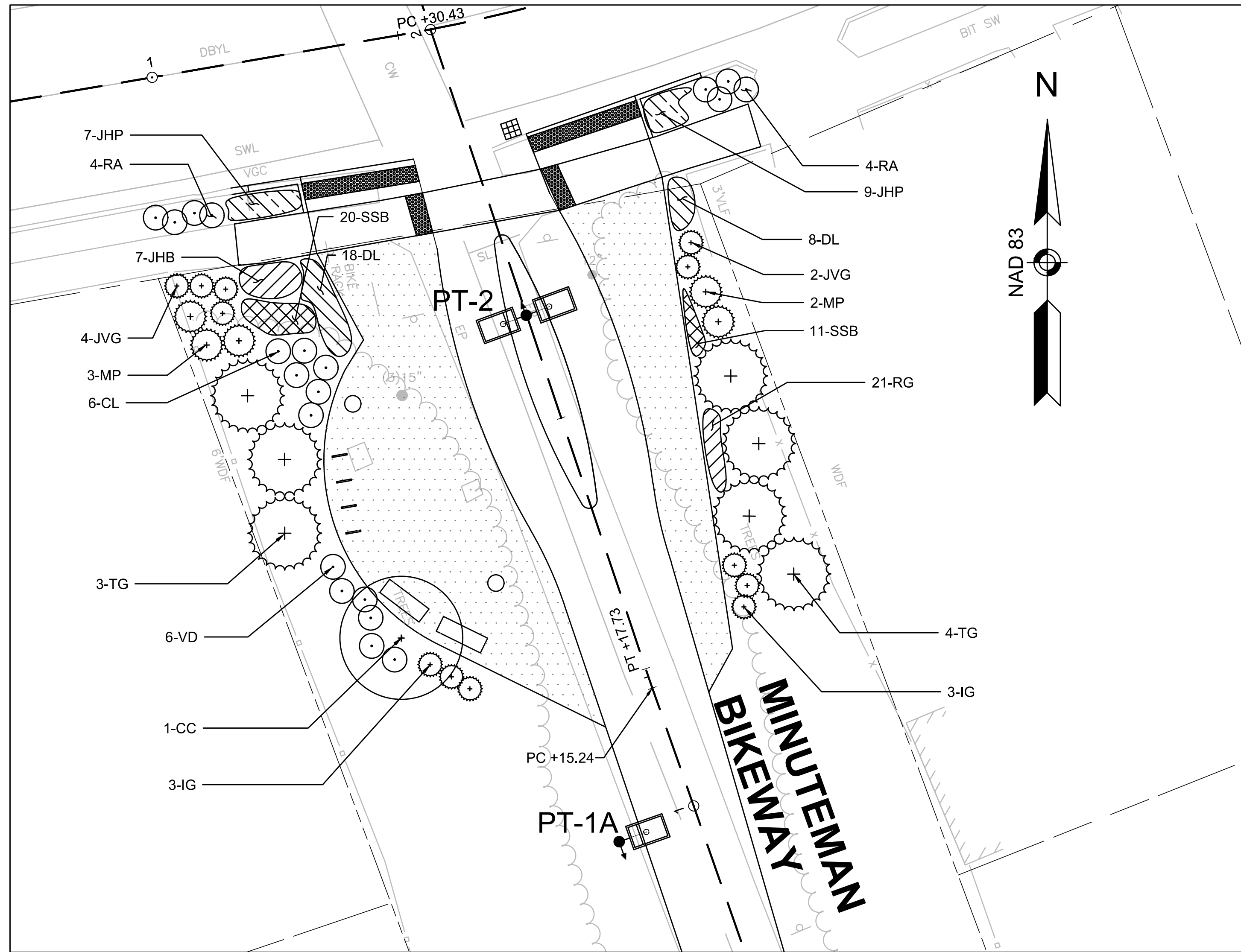
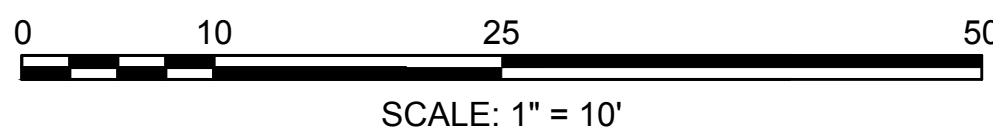
PREPARED BY:  
GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

SCALE: AS NOTED  
DATE: 10/11/2019  
PROJECT NO. 17067.015  
DESIGNED BY: JR  
DRAWN BY: AS  
CHECKED BY: JR  
SHEET NO.  
22 OF 32

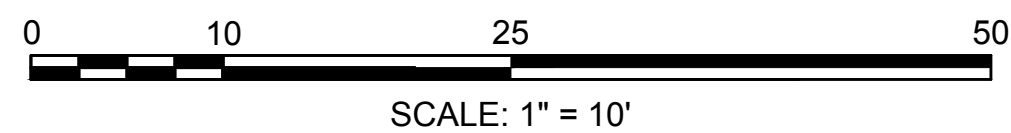




1 PLANTING PLAN NORTH OF LAKE STREET



2 PLANTING PLAN SOUTH OF LAKE STREET



NOTES:

1. ALL PLANT MATERIALS SHOWN ON THIS SHEET ARE TO BE INCLUDED UNDER BID ALTERNATE 2.
2. ALL PROPOSED LIGHTING STRUCTURES AND LUMINAIRES (PT-1A, PT-1B & PT-2) SHOWN ON THIS PLAN SHALL BE INCLUDED UNDER BID ALTERNATE 1.
3. SEE SHEET 25 FOR PLANT LIST.
4. LOCATION OF PLANT MATERIAL SHALL BE APPROVED IN THE FIELD BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.  
ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET  
DESIGN SUBMISSION:  
CONTRACT DOCUMENTS  
DRAWING TITLE: LANDSCAPE PLANTING PLAN  
BID ALTERNATE 2

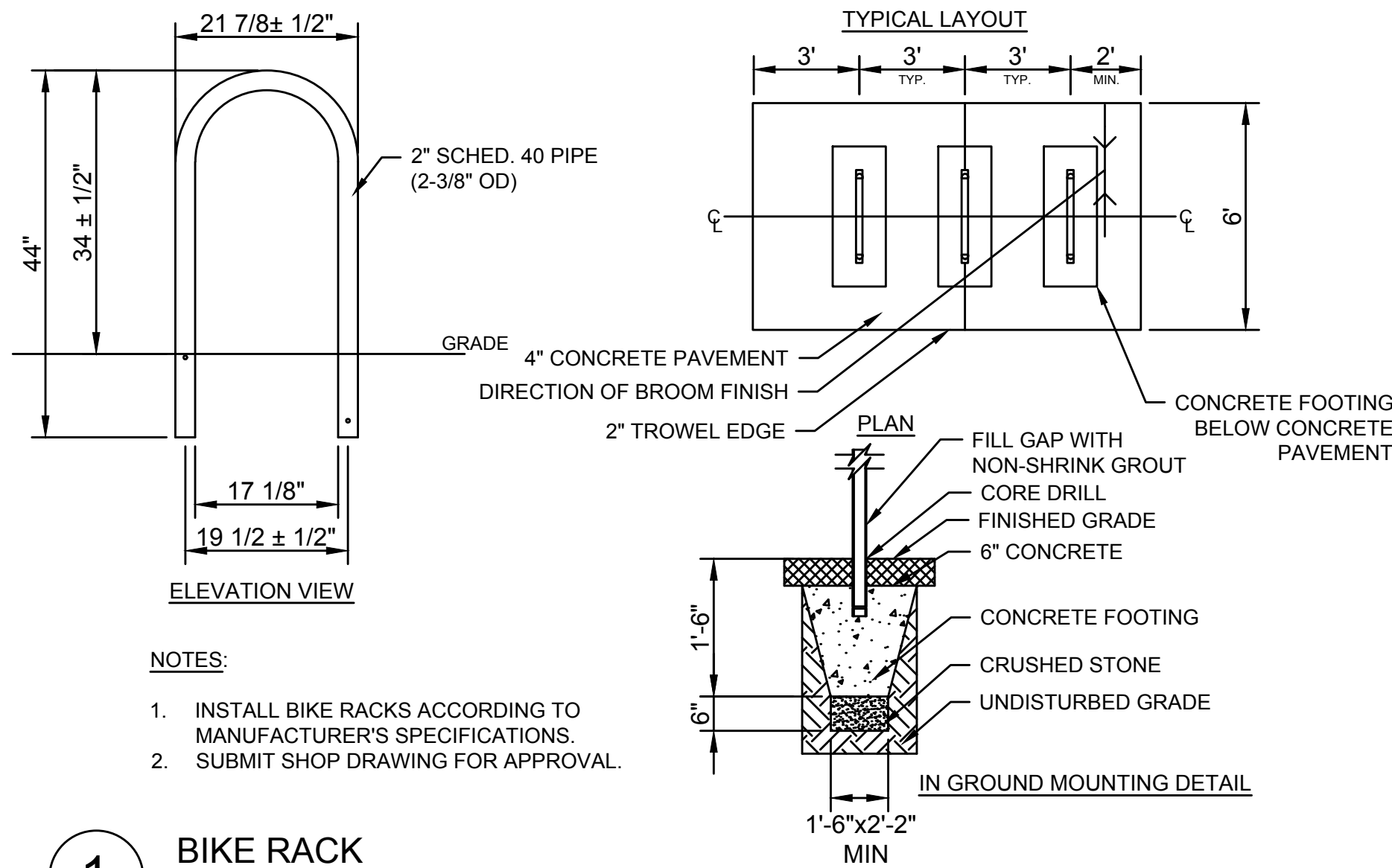
PREPARED FOR:  
TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

SCALE: AS NOTED  
DATE: 10/11/2019  
PROJECT NO. 17067.015  
DESIGNED BY: JR  
DRAWN BY: AS  
CHECKED BY: JR  
SHEET NO.  
23 OF 32

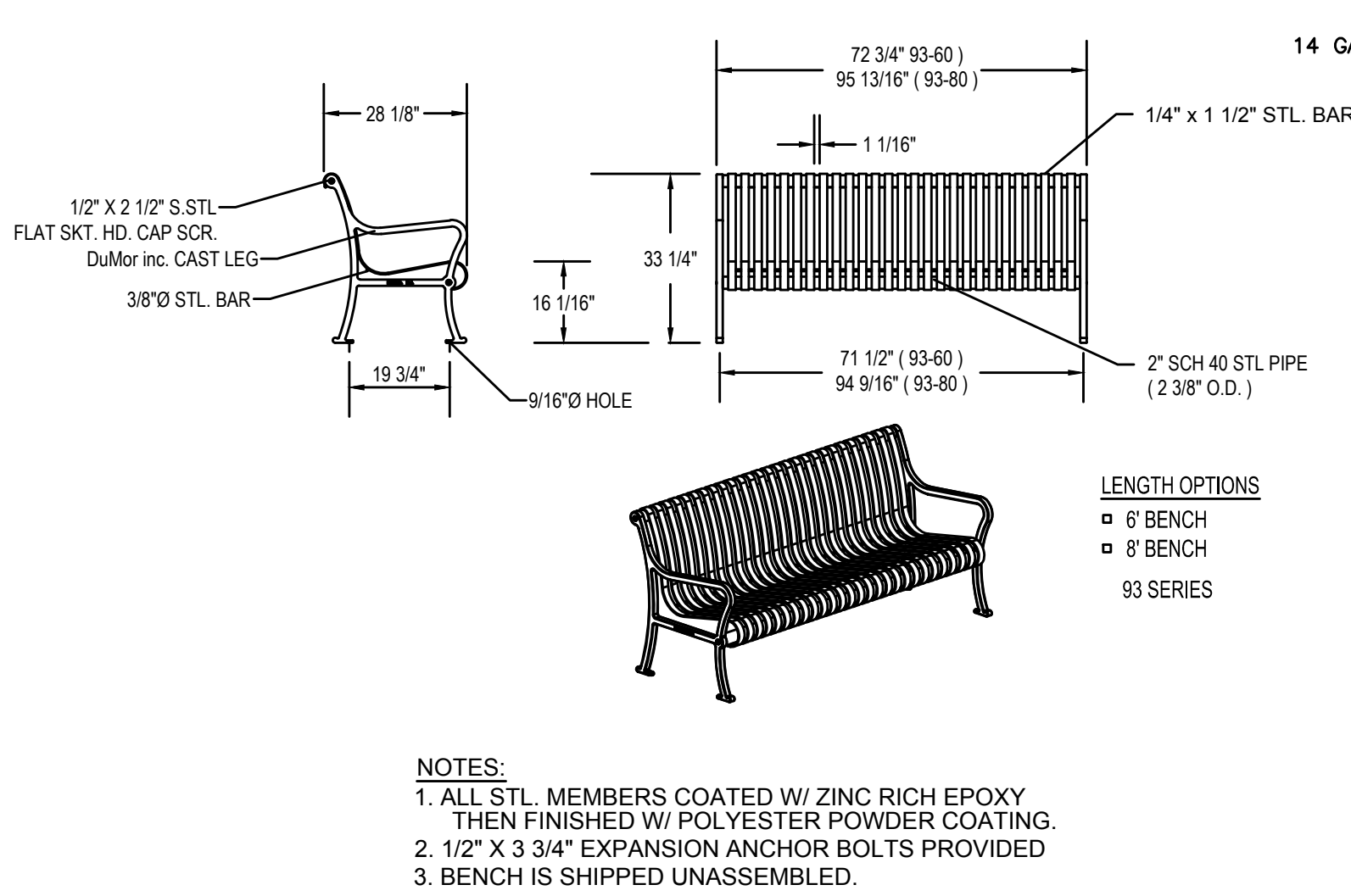
NO. DATE REVISIONS





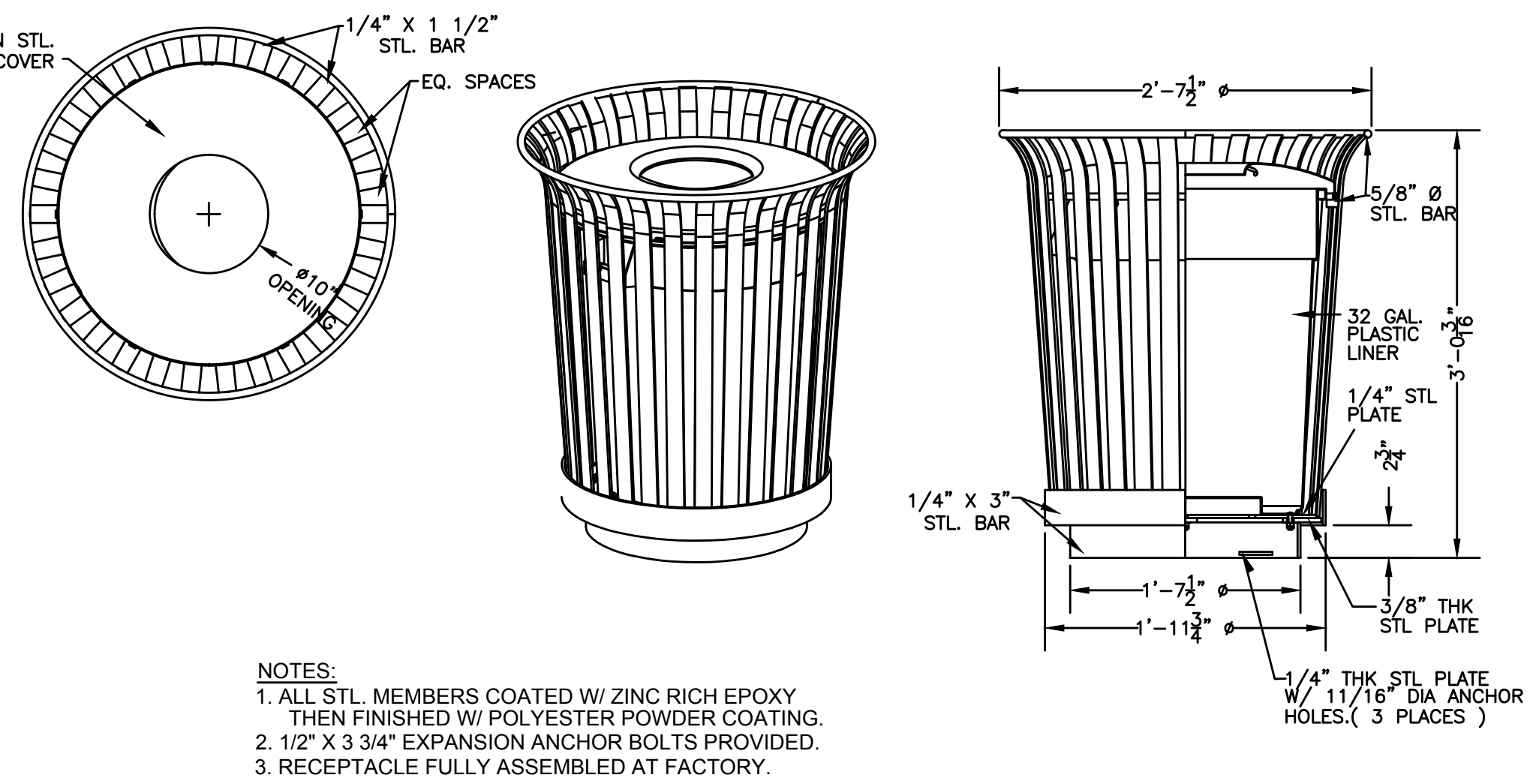
**1 BIKE RACK**

NOT TO SCALE



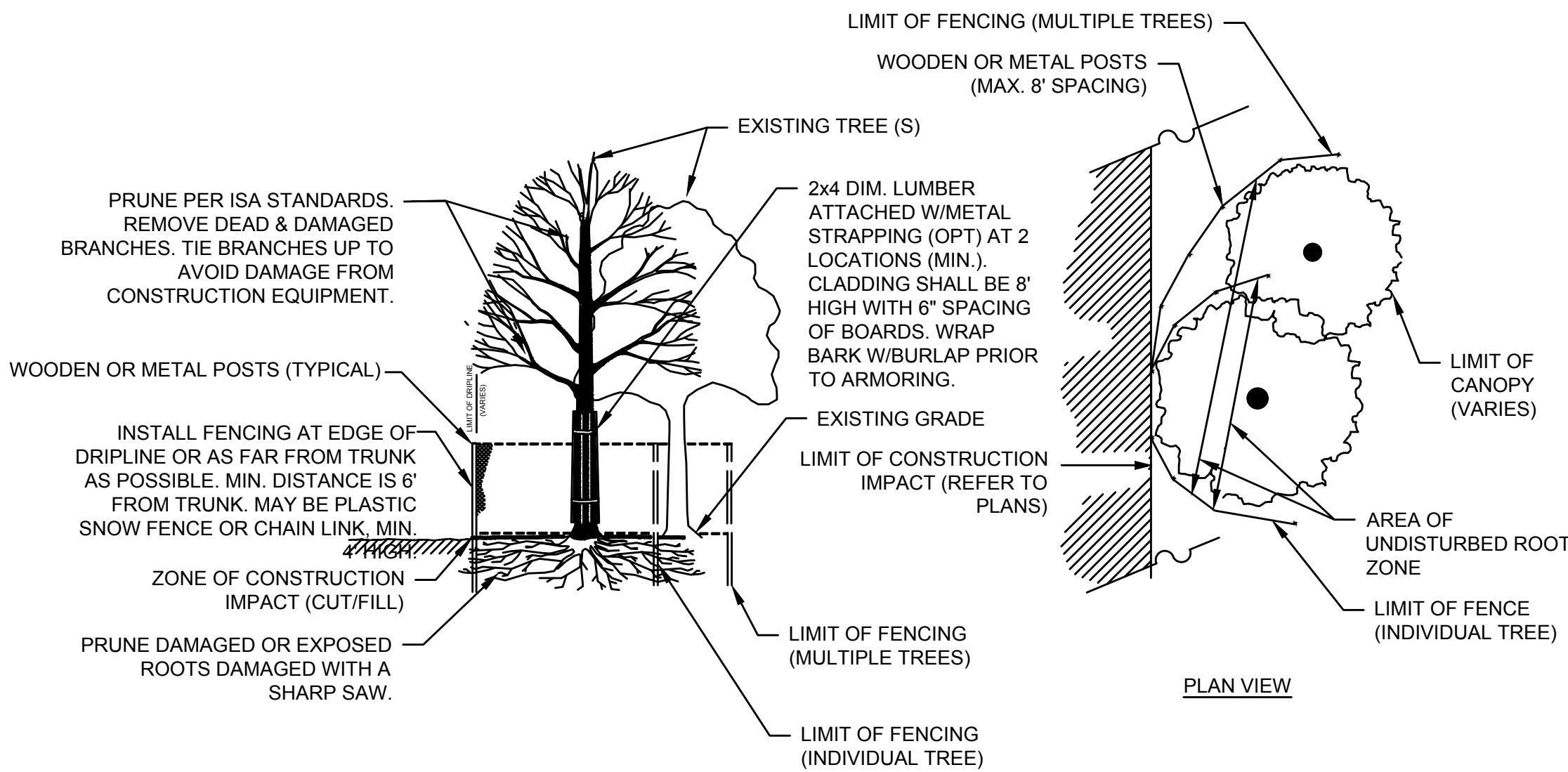
**2 STEEL BENCH**

NOT TO SCALE



**3 TRASH RECEPTACLE**

NOT TO SCALE



**4 TREE PROTECTION OF EXISTING TREES**

NOT TO SCALE

PROJECT: **MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET**

DESIGN SUBMISSION: **CONTRACT DOCUMENTS**

DRAWING TITLE: **LANDSCAPE DETAILS 1 BID ALTERNATE 2**

PREPARED FOR:  
**TOWN OF ARLINGTON  
ENGINEERING DIVISION**  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
**GREEN INTERNATIONAL AFFILIATES, INC.**  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

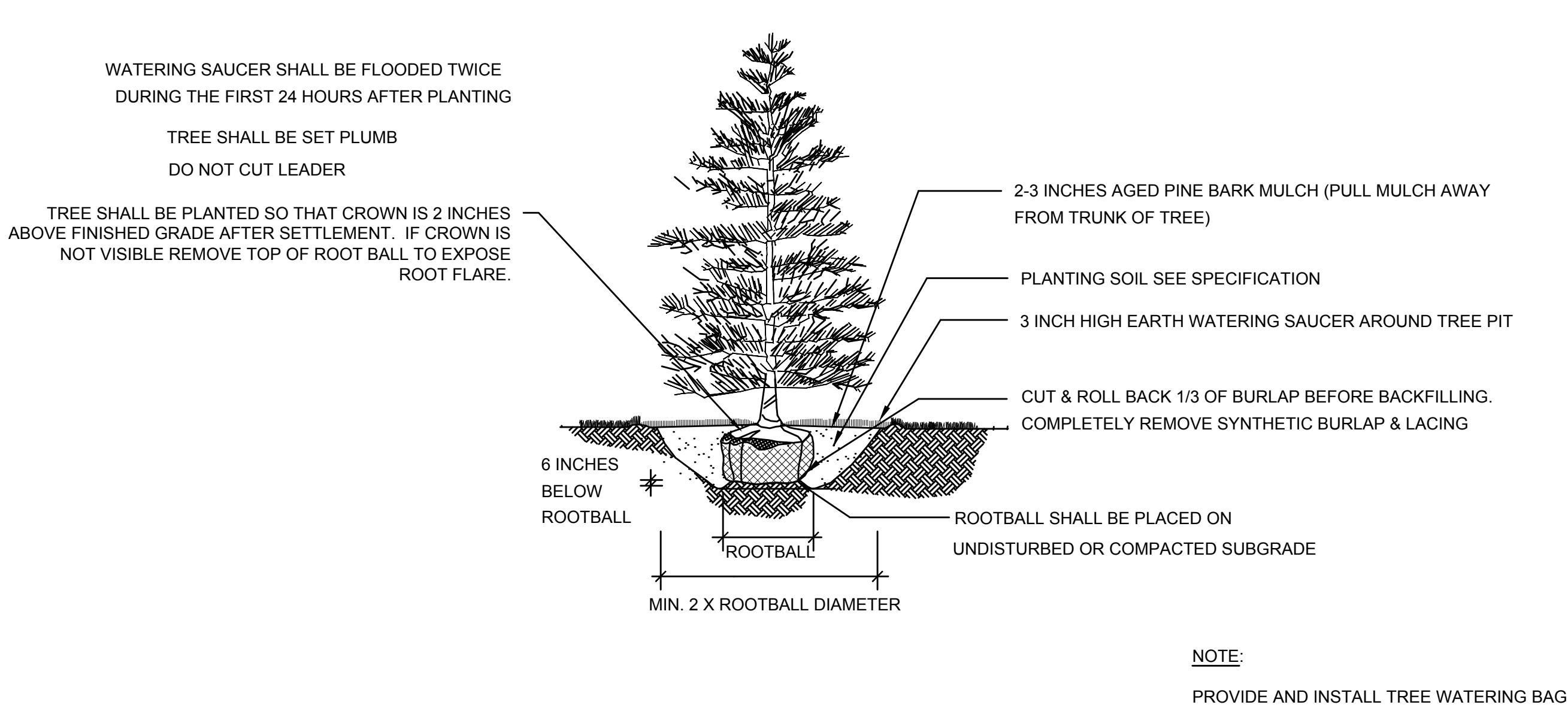
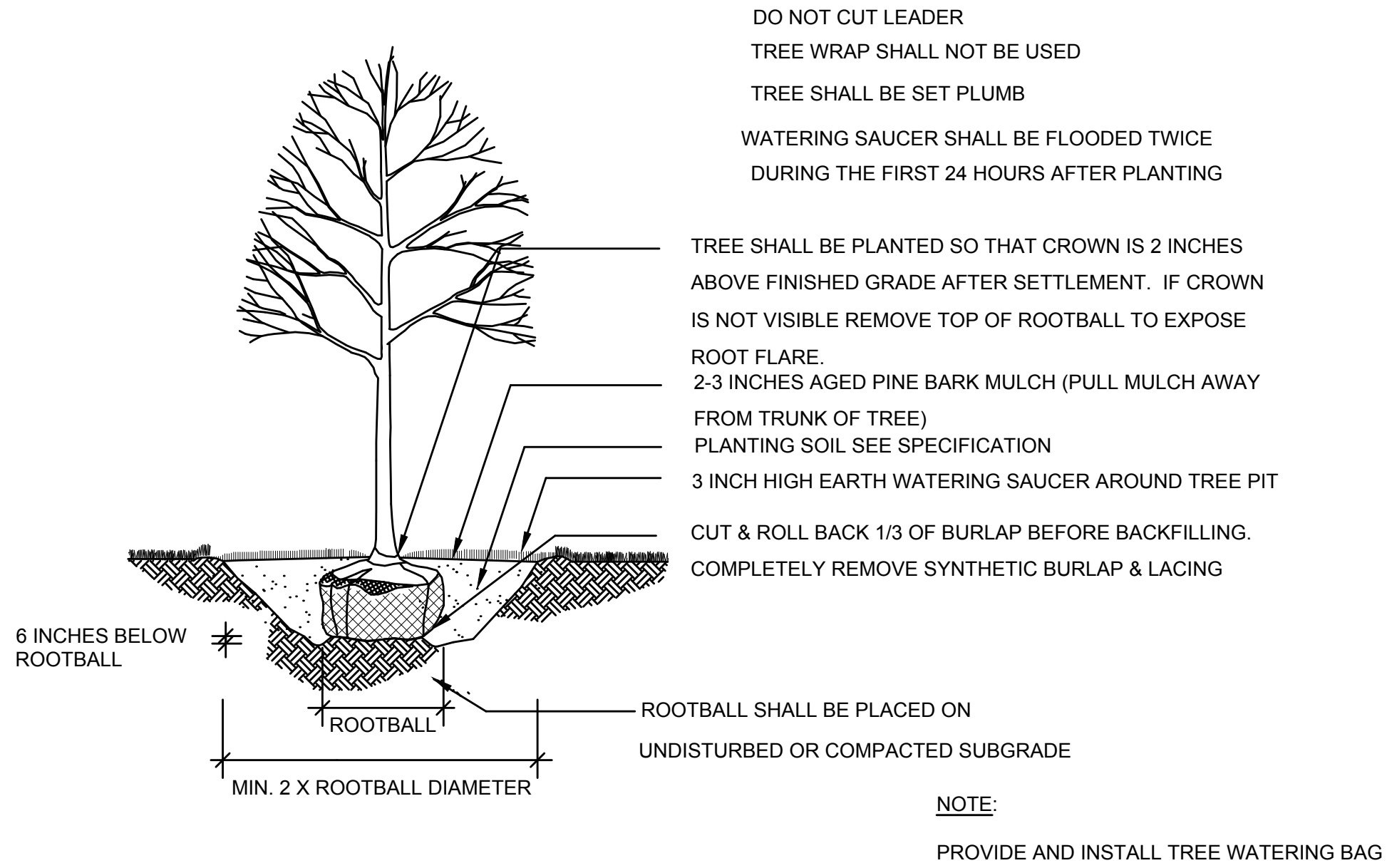
LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

SCALE: AS NOTED	DESIGNED BY: AS	SHEET NO. <b>24</b> OF <b>32</b>
DATE: 10/11/2019	DRAWN BY: AS	
PROJECT NO. 17067.015	CHECKED BY: JR	

NO.	DATE	REVISIONS





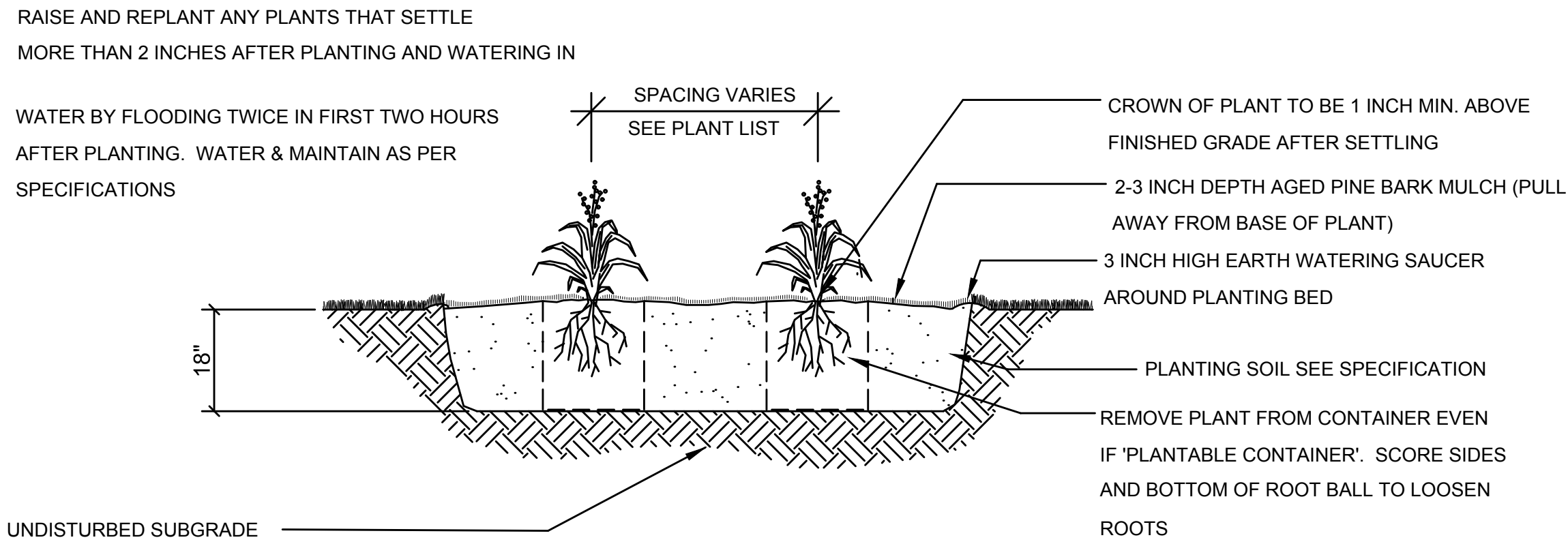
## 1 DECIDUOUS TREE PLANTING

NOT TO SCALE

## 5 EVERGREEN PLANTING

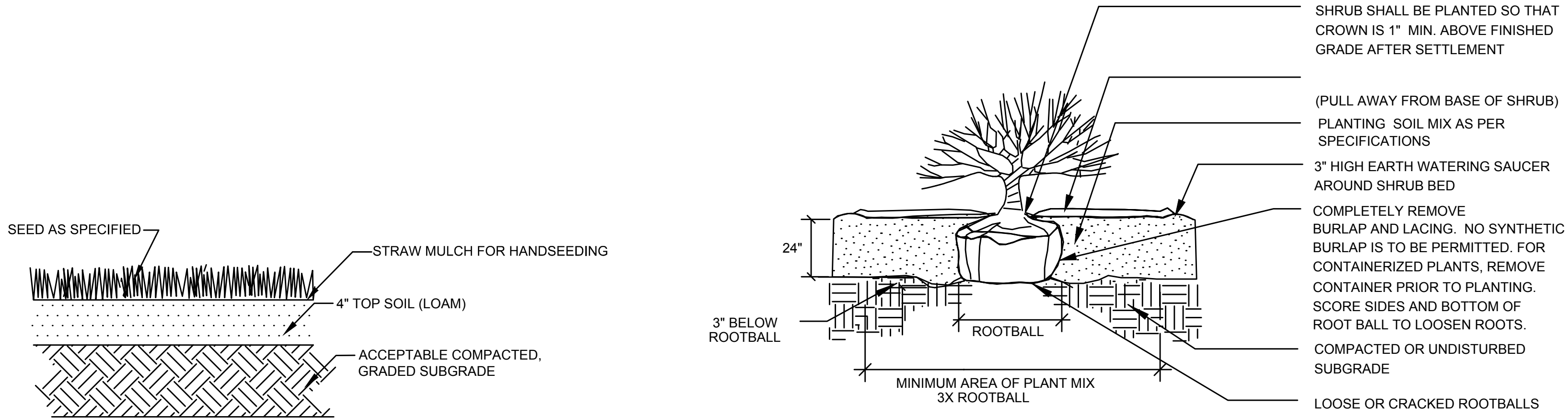
NOT TO SCALE

PLANT LIST					
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS/ ROOT SPACING
DECIDUOUS TREES					
CC	2	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	2-2 1/2" CAL	TREE FORM B&B
OV	1	OSTRYA VIRGINIANA	AMERICAN HOPHORNBEAM	2-2 1/2" CAL	TREE FORM B&B
EVERGREEN TREES					
TG	7	THUJA PLICATA 'GREEN GIANT'	GREEN GIANT ARBORVITEA	6-7' HT	B&B
DECIDUOUS SHRUBS					
OR	10	CORNUS RACEMOSA	GRAY TWIG DOGWOOD	3-4' HT	4' O.C. CONT #7
CL	25	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET	2-3' FT	3' O.C. CONT #5
DL	47	DIERVILLA LONICERA	NATIVE HONEYSUCKLE	18-24" SP.	18" O.C. CONT 3
RA	28	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	18-24" SP.	3' O.C. CONT #3
VD	19	VIBURNUM DENTATUM 'CHRISTOM'	BLUE MUFFIN VIBURNUM	3-4' HT	4' O.C. CONT #7
EVERGREEN SHRUBS					
IG	22	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	2-3' FT	3' O.C. CONT #5
JHB	16	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24" SP.	2' O.C. CONT #2
JHP	44	JUNIPERUS HORIZONTALIS PLUMOSA COMPACTA	COMPACT ANDORRA JUNIPER	18-24" SP.	2' O.C. CONT #2
JVG	6	JUNIPERUS VIRGINIANA 'GREY OWL'	GREY OWL JUNIPER	2-2.5' SP.	3' O.C. CONT #3
MP	5	MYRICA PENNSYLVANICA	BAYBERRY	3-4' HT	4' O.C. B&B
PERENNIALS AND GRASSES					
RG	91	RUDBECKIA FULVA 'GOLDSTRM'	BLACK EYED SUSAN	CONT #2	12" O.C. CONT #2
HH	75	HEMEROCALLIS 'HAPPY RETURNS'	HAPPY RETURNS DAYLILLY	CONT #2	9" O.C. CONT #2
SSB	51	SCHIZACHYIUM SCOPARIUM 'THE BLUES'	THE BLUES LITTLE BLUESTEM	CONT #2	12" O.C. CONT #2



## 2 PERENNIAL

NOT TO SCALE




## 4 SHRUB PLANTING DETAIL

NOT TO SCALE

PROJECT: **MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET**

DESIGN SUBMISSION: **CONTRACT DOCUMENTS**

DRAWING TITLE: **LANDSCAPE DETAILS 2 BID ALTERNATE 2**

PREPARED FOR:  
 **TOWN OF ARLINGTON ENGINEERING DIVISION**  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
 **GREEN INTERNATIONAL AFFILIATES, INC.**  
Civil and Structural Engineers  
Westford, Massachusetts (978) 923-0400  
GreenIntl.com

SCALE: AS NOTED

DESIGNED BY: JR

DATE: 10/11/2019

DRAWN BY: AS

PROJECT NO. 17067.015

CHECKED BY: JR

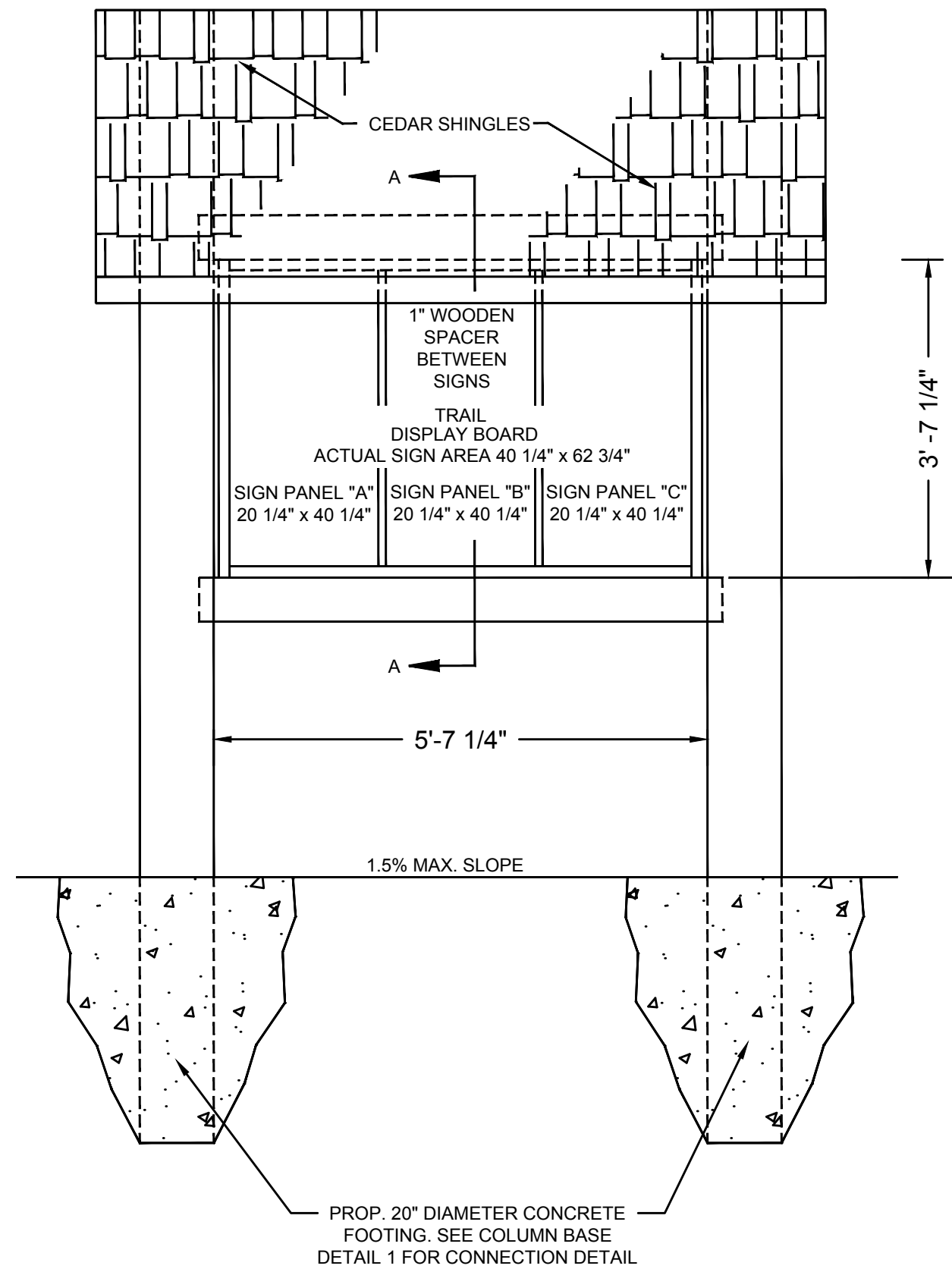
SHEET NO.  
**25** OF **32**

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

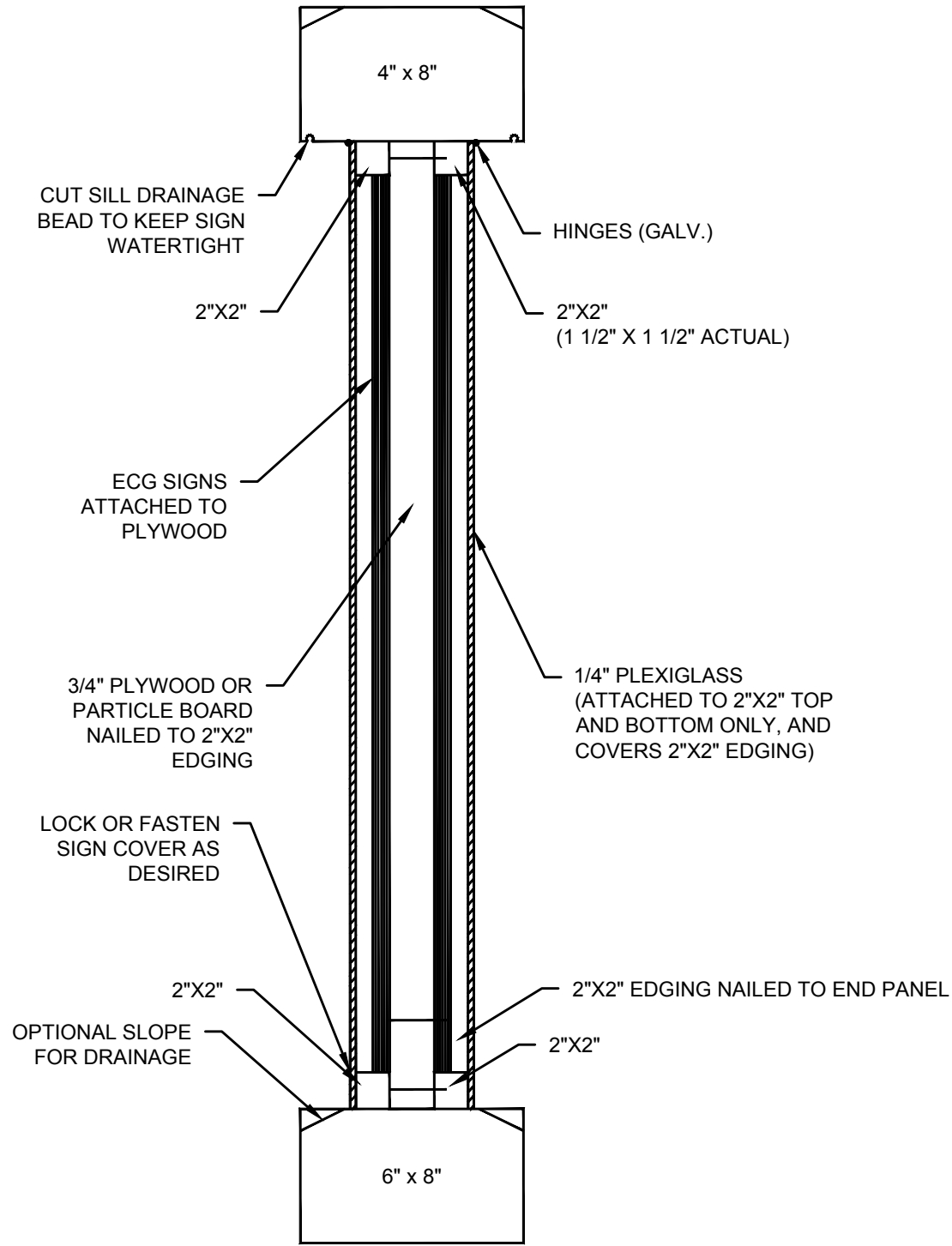
ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

NO. DATE REVISIONS

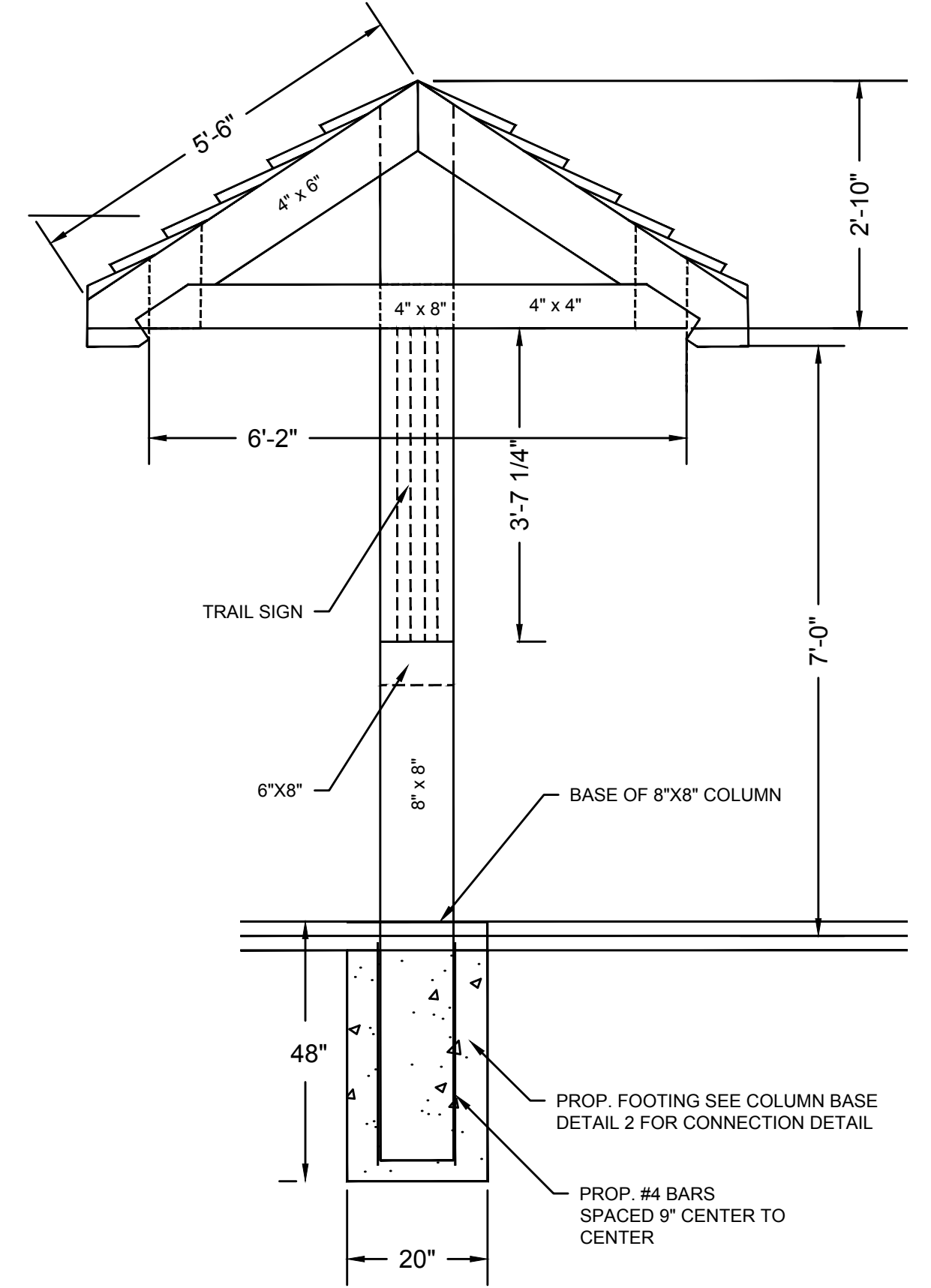




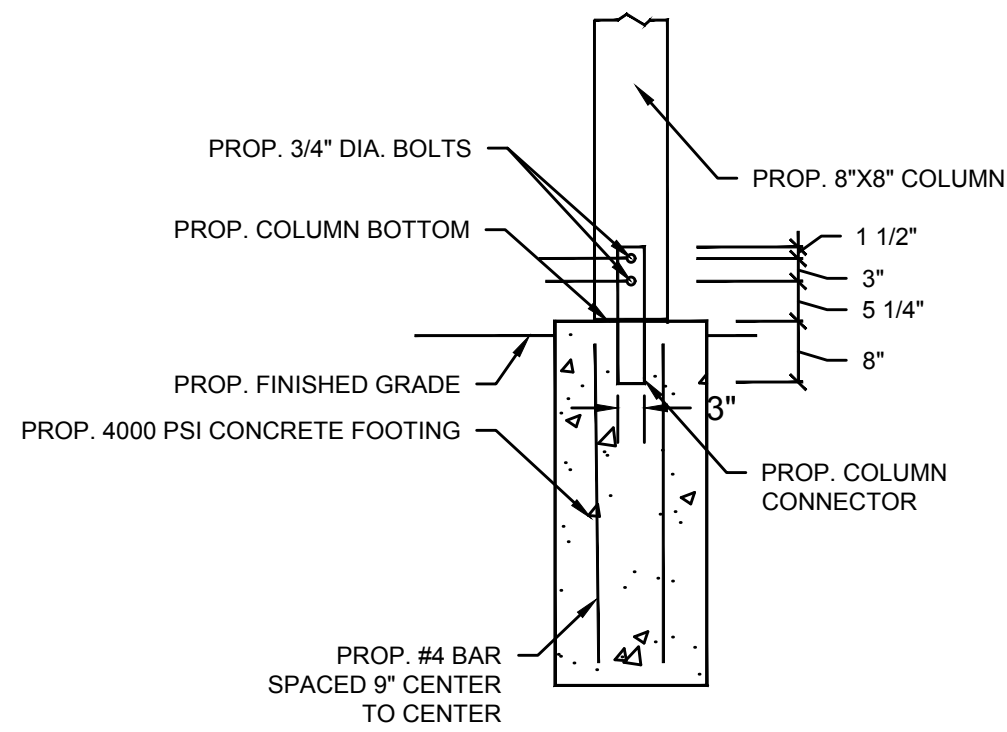
**7** TRAIL DISPLAY BOARD FRONT VIEW  
NOT TO SCALE



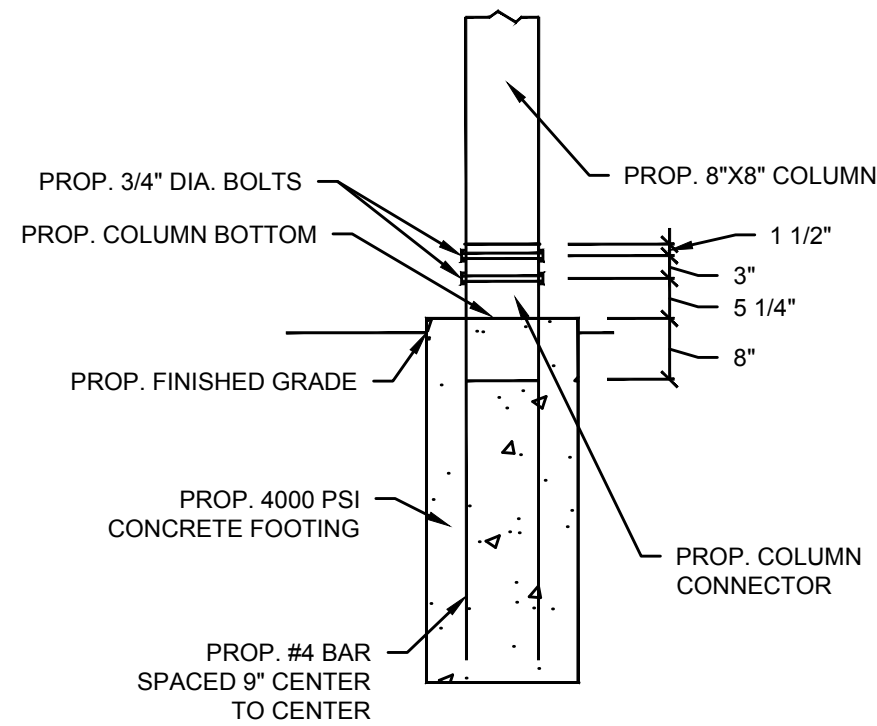
**8** TRAIL DISPLAY BOARD CROSS-SECTION A-A  
NOT TO SCALE





**9** TRAIL DISPLAY BOARD SIDE VIEW  
NOT TO SCALE



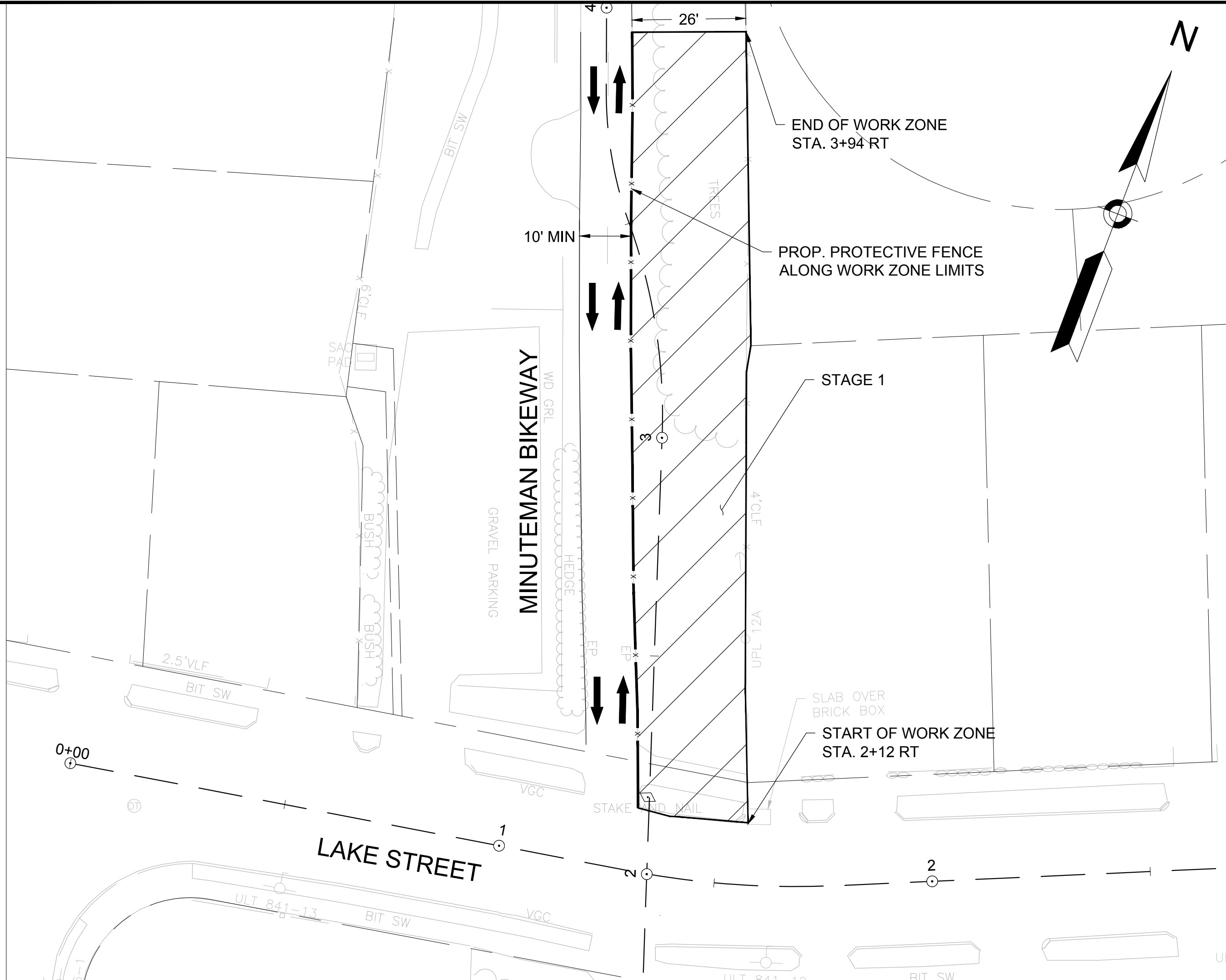
**10** COLUMN BASE - DETAIL 1  
NOT TO SCALE



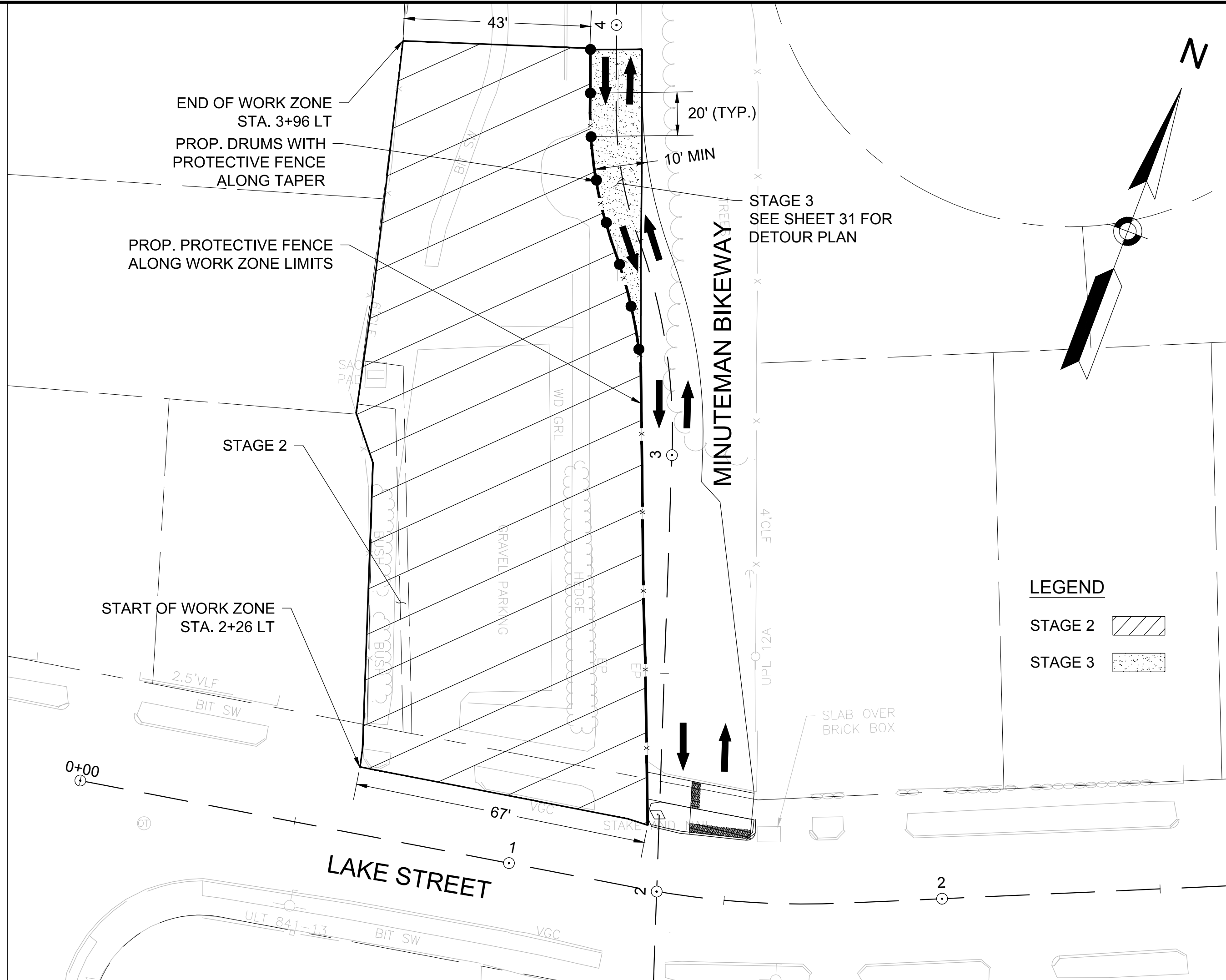
**11** COLUMN BASE - DETAIL 2  
NOT TO SCALE

LIGHTING DESIGN SERVICES LUMEN STUDIO, INC.			<div>PREPARED FOR:</div> <div><div>TOWN OF ARLINGTON ENGINEERING DIVISION 51 GROVE STREET ARLINGTON, MA 02476</div></div>		
ELETRICAL WIRING DESIGN SERVICES ENGINEERING ADVANTAGE, INC.			<div>PREPARED BY:</div> <div><div>GREEN INTERNATIONAL AFFILIATES, INC. Civil and Structural Engineers Westford, Massachusetts (978) 923-0400 GreenIntl.com</div></div>		
			SCALE: AS NOTED	DESIGNED BY: AS	SHEET NO. <div>26 OF 32</div>
			DATE: 10/11/2019	DRAWN BY: AS	
			PROJECT NO. 17067.015	CHECKED BY: JR	
NO.	DATE	REVISIONS			

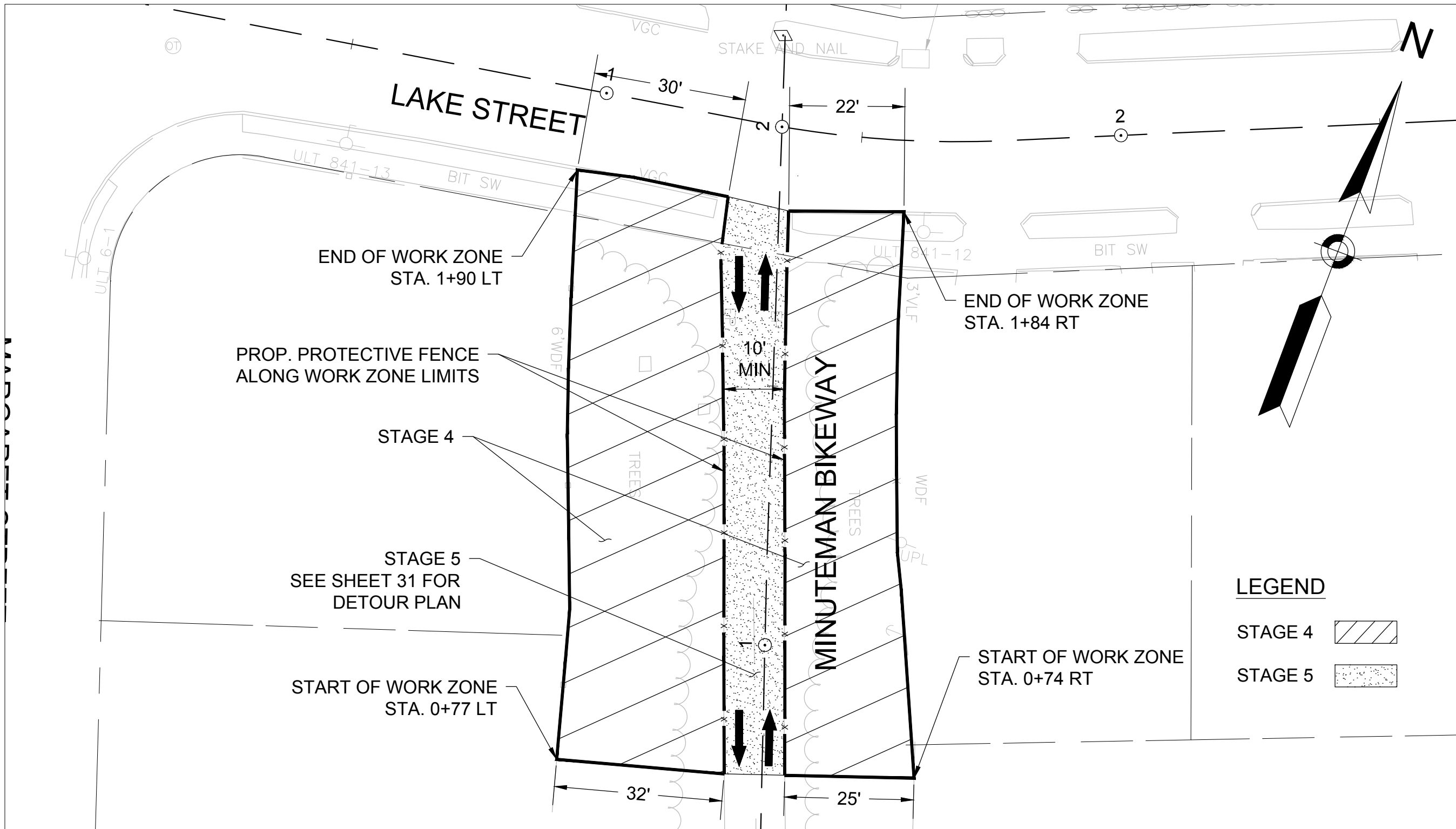




STAGE 1 FOR CONSTRUCTION  
ALONG MINUTEMAN BIKEWAY  
NORTH OF LAKE STREET

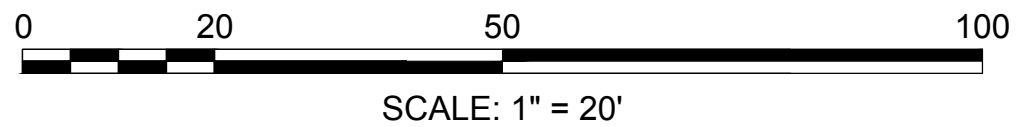


STAGE 2 AND 3 FOR CONSTRUCTION  
ALONG MINUTEMAN BIKEWAY  
NORTH OF LAKE STREET



STAGE 4 AND 5 FOR CONSTRUCTION  
ALONG MINUTEMAN BIKEWAY  
SOUTH OF LAKE STREET

- NOTES:
1. SEE DETAIL ON SHEET 29 FOR ADVANCED WARNING SIGNAGE ALONG MINUTEMAN BIKEWAY.
  2. FOR STAGES 1, 2 AND 4 SEE SHEET 28 FOR TYPICAL DETAIL OF SIDEWALK CLOSURE AND SHEET 29 FOR TYPICAL DETAIL OF SHOULDER AND MINOR LANE ENCROACHMENT.
  3. STAGES 3 AND 5 SHALL NOT BE IMPLEMENTED CONCURRENTLY.



LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.


ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: **MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET**

DESIGN SUBMISSION:  
**CONTRACT DOCUMENTS**

DRAWING TITLE:  
**CONSTRUCTION STAGING PLAN**

PREPARED FOR:  
 **TOWN OF ARLINGTON  
ENGINEERING DIVISION**  
51 GROVE STREET  
ARLINGTON, MA 02476

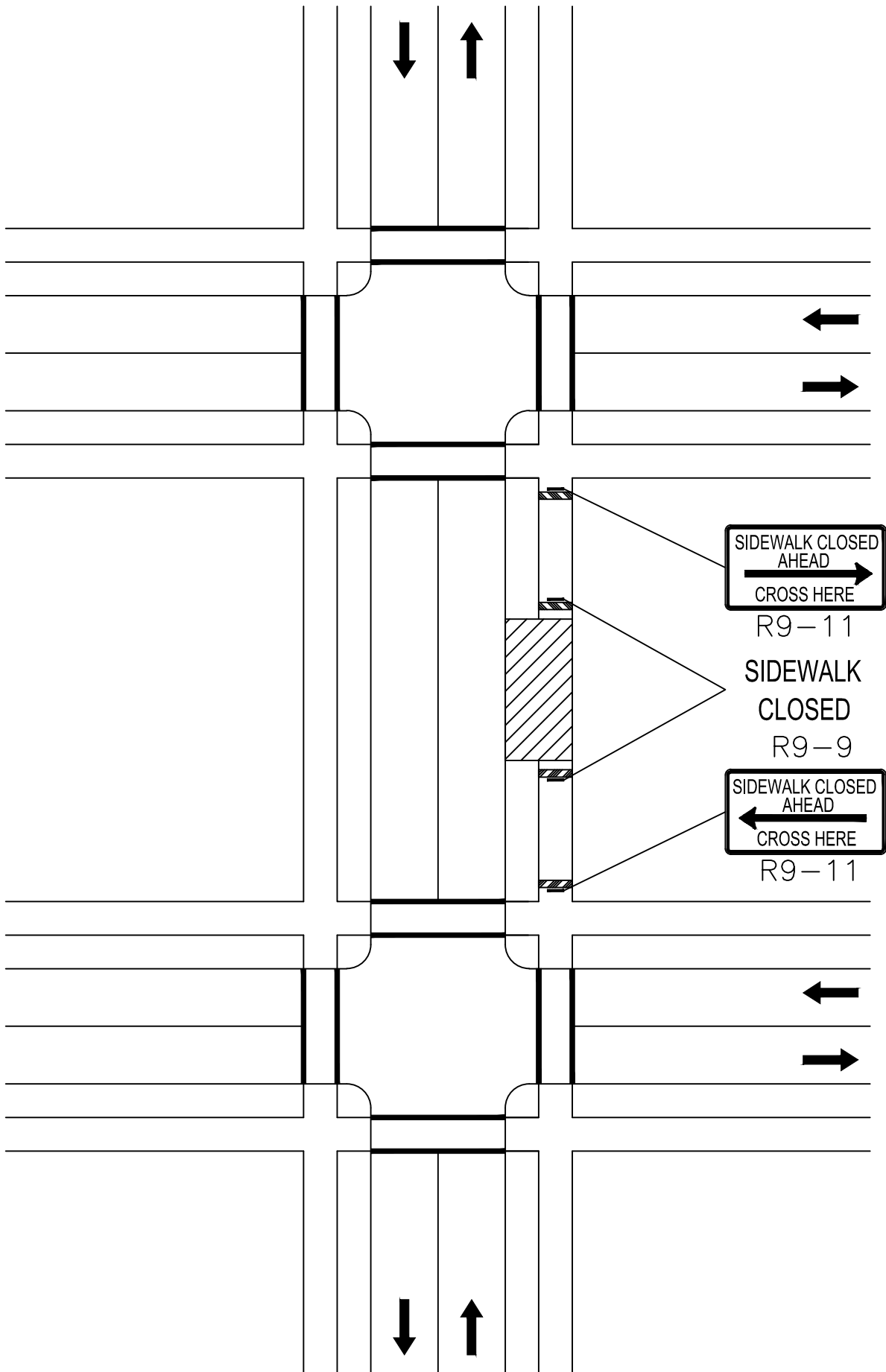
PREPARED BY:  
 **GREEN INTERNATIONAL AFFILIATES, INC.**  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
GreenIntl.com

SCALE: AS NOTED	DESIGNED BY: AV	SHEET NO. <b>27</b> OF <b>32</b>
DATE: 10/11/2019	DRAWN BY: AV	
PROJECT NO. 17067.015	CHECKED BY: JG/WW	



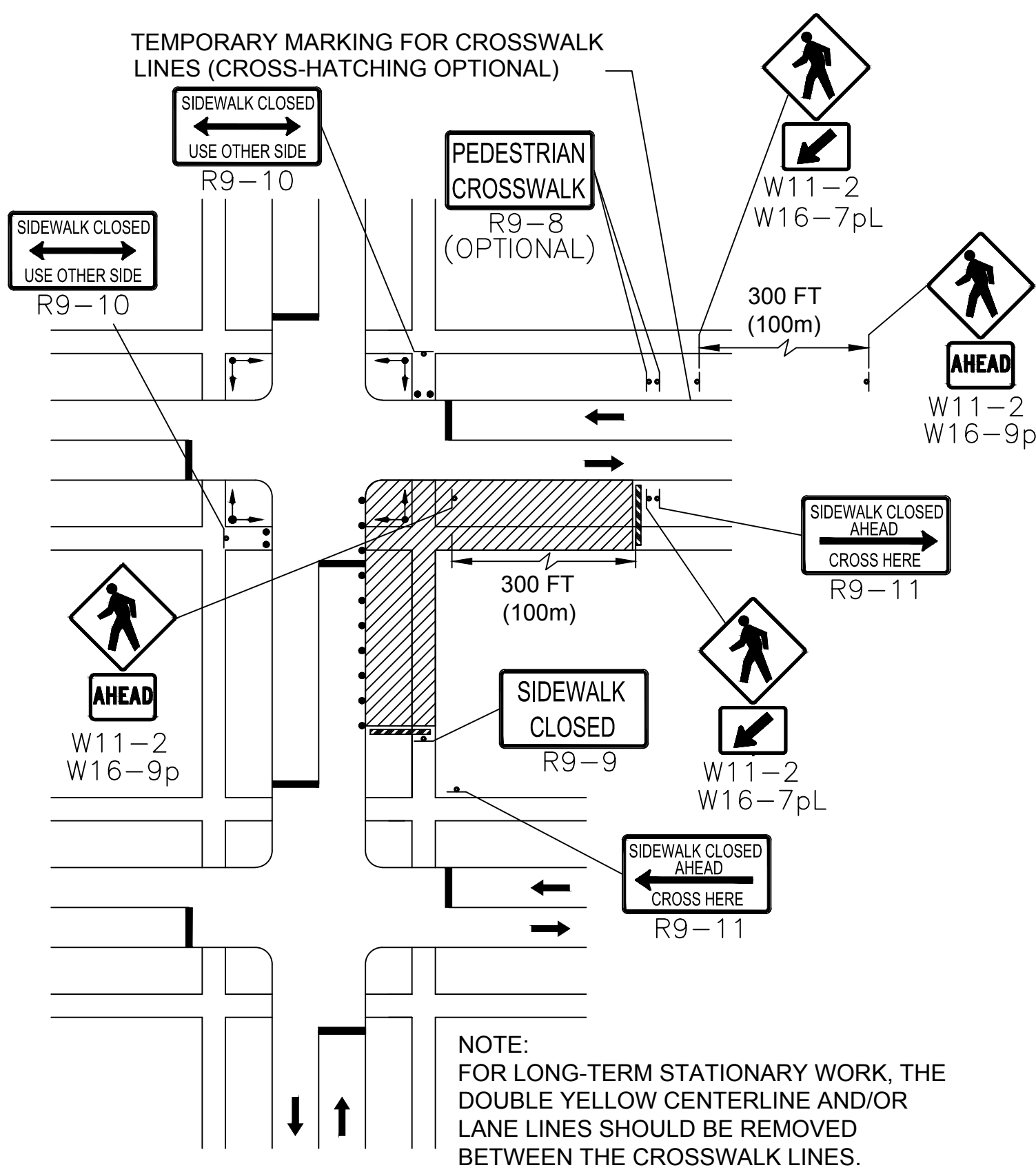
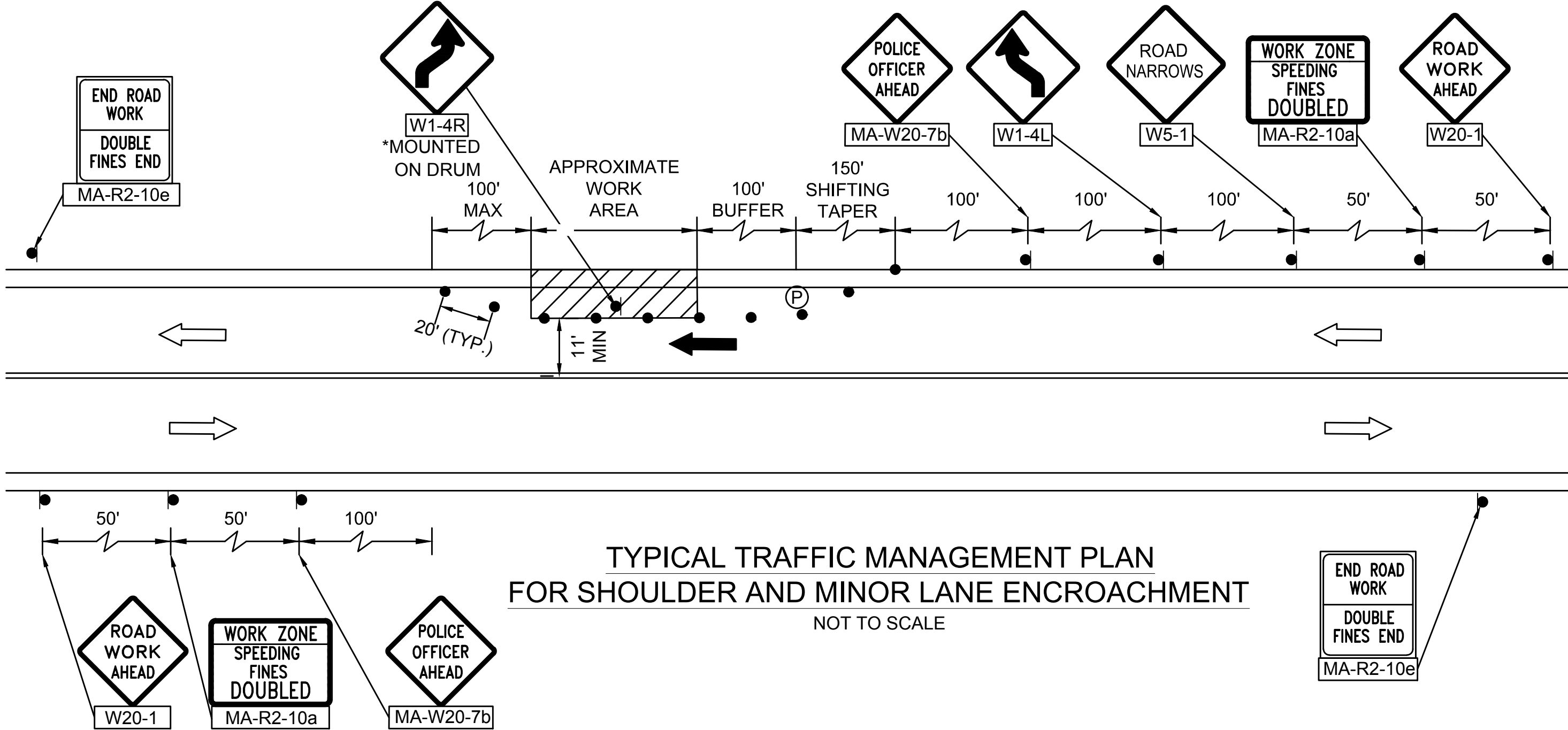
TEMPORARY TRAFFIC CONTROL NOTES:

1. MINIMUM LANE WIDTH OF 11 FEET SHALL BE MAINTAINED ALONG LAKE STREET ALL THE TIME. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF THE DRUMS OR CONES (IF USED).
2. MINIMUM PAVEMENT WIDTH OF 10 FEET SHALL BE MAINTAINED ALONG THE MINUTEMAN BIKEWAY ALL THE TIME EXCEPT DURING CONSTRUCTION STAGES 3 & 5 WHEN DETOUR PLANS ARE IMPLEMENTED. MINIMUM PAVEMENT WIDTH TO BE MEASURED FROM THE EDGE OF THE DRUMS OR TEMPORARY FENCE.
3. THE CONTRACTOR SHALL COORDINATE APPROVAL OF ANY CHANGES TO THE TEMPORARY TRAFFIC CONTROL PLAN WITH THE TOWN OF ARLINGTON PRIOR TO CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL ALSO NOTIFY THE TOWN OF ARLINGTON THREE (3) WEEKS IN ADVANCE OF PLACING TEMPORARY TRAFFIC CONTROL SIGNS.
4. THESE PLANS ARE NOT INTENDED TO LIMIT THE CONTRACTOR'S APPROACH TO SCHEDULE THE WORK BUT TO OUTLINE ONE WAY OF PROGRESSING. THE CONTRACTOR IS EXPECTED TO USE KNOWLEDGE AND EXPERIENCE TO PERFORM THE WORK IN THE MOST EFFICIENT AND SAFE MANNER IN COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS.
5. PLACE ALL SAFETY DEVICES AND CONSTRUCTION SIGNING BEFORE ACTUAL CONSTRUCTION WORK BEGINS.
6. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS WITH THE APPROVAL OF THE ENGINEER.
7. EXISTING SIGNS NO LONGER APPLICABLE SHALL BE TEMPORARILY COVERED DURING CONSTRUCTION OR REMOVED AND RESET UPON COMPLETION OF CONSTRUCTION. THE COST SHALL BE INCIDENTAL TO THE CONTRACTOR.
8. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN THE NCHRP 350 REPORT.
9. TEMPORARY PAVEMENT MARKINGS, NO LONGER APPLICABLE, SHALL BE REMOVED. CONTRACTOR SHALL RECORD EXISTING PAVEMENT MARKINGS AND RESTORE ALL MARKINGS TO EXISTING CONDITIONS AT THE CONCLUSION OF CONSTRUCTION AT EACH LOCATION.
10. ALL TRAFFIC CONTROL DEVICES SHALL BE REMOVED IMMEDIATELY WHEN NO LONGER NEEDED.
11. UNLESS OTHERWISE NOTED, ALL PAVEMENT MARKINGS, SIGNS AND OTHER TRAFFIC EQUIPMENT REMOVED OR DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN CONFORMANCE WITH THE CONTACT DOCUMENTS.
12. CONTRACTOR SHALL INSTALL, RENEW AND MAINTAIN ALL TRAFFIC CONTROL DEVICES AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
13. ACCESS/EGRESS TO ALL ABUTTERS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN EMERGENCY PASSAGE AT ALL TIMES TO BUILDINGS WITHIN AND ADJACENT TO THE PROJECT LIMITS AS WELL AS A LARGER AREA IF AFFECTED BY CONSTRUCTION CONDITIONS. CONTRACTOR SHALL MAINTAIN 24 HOUR EMERGENCY VEHICLE ACCESS TO CONSTRUCTION AREAS.
14. SIDEWALK ACCESS SHALL BE MAINTAINED AT ALL TIMES ON AT LEAST ONE SIDE OF THE STREET.
15. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL ABUTTING PROJECTS.
16. CONTRACTOR SHALL COORDINATE WITH ABUTTERS FOR THE PROPOSED WORK AND SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF THE WORK THAT WILL REQUIRE TEMPORARY CLOSURE OF ACCESS TO THEIR PROPERTY.
17. ALL PROPOSED WORK REQUIRING A TRAVEL LANE CLOSURE ALONG LAKE STREET SHALL BE RESTRICTED TO OFF-PEAK HOURS (9AM-3PM) ONLY MON.-FRI. NO WEEKEND WORK SHALL BE ALLOWED (SAT. & SUN.)
18. PROPOSED MILLING AND OVERLAY AND CONDUIT INSTALLATION WITHIN THE ROADWAY ALONG LAKE STREET SHALL BE LIMITED TO NIGHT WORK (9PM-5AM) ONLY MON.-FRI. ALL NIGHT WORK SHALL BE INCIDENTAL TO THE OVERALL PROJECT COST.
19. PROPOSED WORK ALONG THE MINUTEMAN BIKEWAY THAT DOES NOT ENCROACH INTO LAKE STREET SHALL BE RESTRICTED TO 7AM-5PM ONLY MON.-FRI. NO WEEKEND WORK SHALL BE ALLOWED (SAT. & SUN.)



NOTE: IF A MINIMUM WIDTH OF 48" OF SOLID SMOOTH UNOBSTRUCTED SURFACE REMAINS ALONG THE WORK AREA THEN THE DETAIL CAN BE DISREGARDED. DELINEATION OF THE WORK AREA WILL STILL BE REQUIRED. ALL PEDESTRIAN DETOUR ROUTES SHALL BE ADA/MAAB COMPLIANT IN THEIR ENTIRETY.

SIDEWALK CLOSURE  
WITHOUT DETOUR  
NOT TO SCALE



PEDESTRIAN DETOUR  
NOT TO SCALE

PCMS ADVANCED NOTIFICATION

MESSAGE 1	MESSAGE 2
ROAD WORK XX FT	MM/DD TO MM/DD

NOTE:

1. THE PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE DEPLOYED ONE (1) MONTH PRIOR TO THE START OF CONSTRUCTION. THE MESSAGE SIGN SHALL CHANGE UPON THE START OF CONSTRUCTION. THE PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE REMOVED AFTER CONSTRUCTION WORK IS COMPLETED. THE CONTRACTOR SHALL NOTIFY APPLICABLE LOCAL AGENCIES (3) WEEKS IN ADVANCE OF PLACING PCMS ASSEMBLIES.

TRAFFIC DEVICE LEGEND

	WORK ZONE
	DIRECTION OF VEHICULAR TRAFFIC
	DIRECTION OF PROPOSED VEHICULAR TRAFFIC
	SIGN
	TYPE III BARRICADE
	REFLECTORIZED PLASTIC DRUM OR 36" CONE
	POLICE OFFICER
	PCMS BOARD

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

NO. DATE REVISIONS

PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION:  
CONTRACT DOCUMENTS

DRAWING TITLE:  
TRAFFIC MANAGEMENT PLAN 1

PREPARED FOR:  
TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers  
Westford, Massachusetts  
(978) 923-0400  
Greenintl.com

SCALE: AS NOTED

DATE: 10/11/2019

PROJECT NO. 17067.015

DESIGNED BY: AV

DRAWN BY: AV

CHECKED BY: JG/WW

SHEET NO.

28 OF 32





PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET

DRAWING TITLE:  
**TRAFFIC MANAGEMENT PLAN 2**

PREPARED BY:

 **GREEN INTERNATIONAL AFFILIATES, INC.**  
Civil and Structural Engineers (978) 923-0400  
Westford, Massachusetts GreenIntl.com

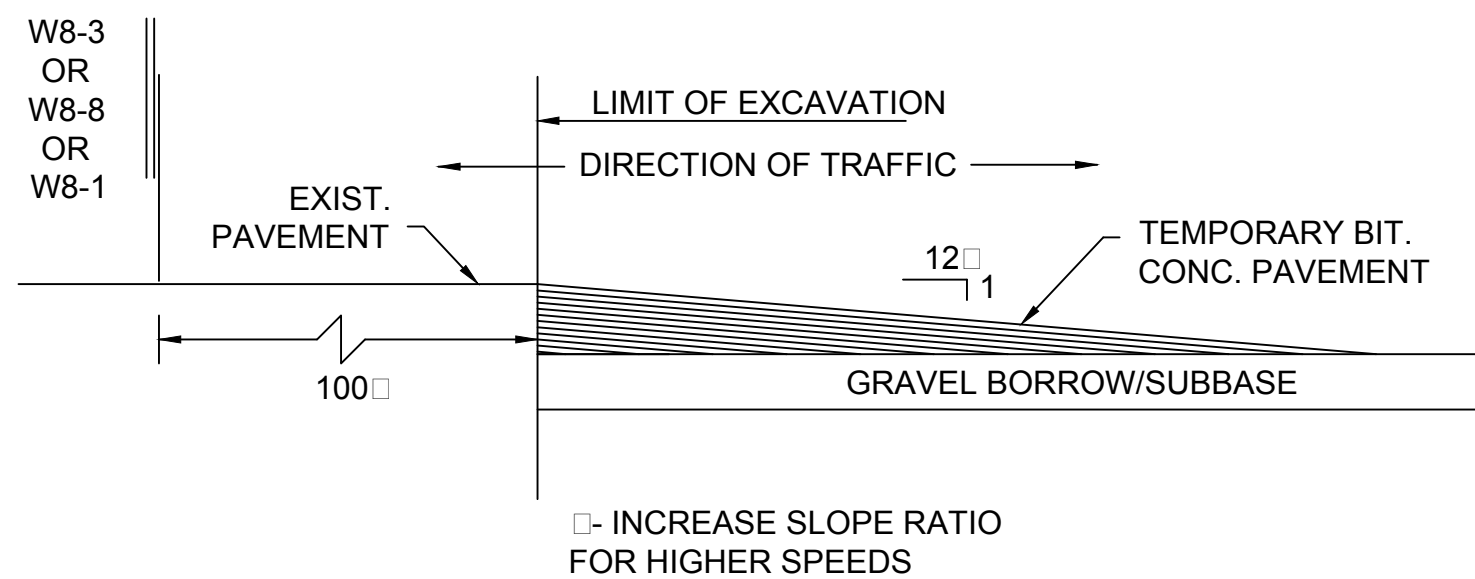
SCALE: AS NOTED	DESIGNED BY: AV	SHEET NO.  29 OF 32
DATE: 10/11/2019	DRAWN BY: AV	
PROJECT NO. 17067.015	CHECKED BY: JG/WW	

<u>LIGHTING DESIGN SERVICES</u>		
LUMEN STUDIO, INC.		
<u>ELECTRICAL WIRING DESIGN SERVICES</u>		
ENGINEERING ADVANTAGE, INC.		
NO.	DATE	REVISIONS



1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.

5. CLEAR SPACE OF 48" 48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
6. THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR 2 TO 4 IN. WIDE MARKING. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.



## LATERAL AND LONGITUDINAL DROP-OFF DETAILS

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.

ELECTRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

DESIGN SUBMISSION:  
**CONTRACT DOCUMENTS**

PREPARED FOR:

 TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

SCALE: AS NOTED	DESIGNED BY: AV
DATE: 10/11/2019	DRAWN BY: AV
PROJECT NO. 17067.015	CHECKED BY: JG/WW









SHEET NO.  
30 OF 32

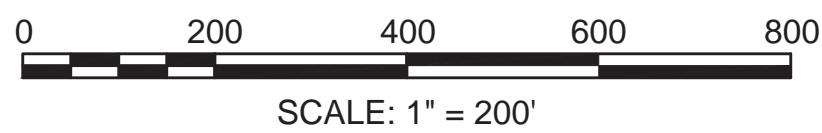
F:\Projects\2017\17067\DWG\Current Design\19 TRAFFIC MANAGEMENT PLAN.dwg Printed: 10/15/2019 3:43 PM



E:\Projects\2017\1706\00\CURRENT DESIGN\30 DETOUR PLAN.dwg Plotted: 10/23/2019 9:23 AM

TRAFFIC DEVICE LEGEND

-  WORK ZONE  
 DIRECTION OF VEHICULAR TRAFFIC  
 DIRECTION OF PROPOSED VEHICULAR TRAFFIC  
 SIGN  
 TYPE III BARRICADE  
 REFLECTORIZED PLASTIC DRUM OR 36" CONE  
 POLICE OFFICER  
 PCMS BOARD



NOTE:

1. THE CONTRACTOR SHALL COORDINATE APPROVAL AND IMPLEMENTATION OF THIS DETOUR PLAN WITH THE TOWN OF ARLINGTON PRIOR TO CONSTRUCTION ACTIVITES.
2. ANY CONFLICTING SIGNAGE SHALL BE COVERED OR REMOVED FOR THE DURATION OF THE DETOUR.
3. ALL SIGNAGE DENOTED WITH "\*" SHALL BE MOUNTED ON TYPE III BARRICADE.
4. THE DETOUR ROUTES SHOWN ON THIS SHEET SHALL NOT BE IMPLEMENTED CONCURRENTLY.

BASE MAP SOURCE: MASSGIS

DETOUR PLAN  
FOR CONSTRUCTION PHASING  
NORTH OF LAKE STREET

BASE MAP SOURCE: MASSGIS

DETOUR PLAN  
FOR CONSTRUCTION PHASING  
SOUTH OF LAKE STREET

LIGHTING DESIGN SERVICES  
LUMEN STUDIO, INC.  
  
ELETRICAL WIRING DESIGN SERVICES  
ENGINEERING ADVANTAGE, INC.

NO.	DATE	REVISIONS

PROJECT: MINUTEMAN BIKEWAY  
IMPROVEMENTS AT LAKE STREET

DESIGN SUBMISSION:  
CONTRACT DOCUMENTS

DRAWING TITLE:  
TRAFFIC MANAGEMENT PLAN 4

PREPARED FOR:  
 TOWN OF ARLINGTON  
ENGINEERING DIVISION  
51 GROVE STREET  
ARLINGTON, MA 02476

PREPARED BY:  
 GREEN INTERNATIONAL AFFILIATES, INC.  
Civil and Structural Engineers (978) 923-0400  
Westford, Massachusetts GreenIntl.com

SCALE: AS NOTED

DATE: 10/11/2019

PROJECT NO. 17067.015

DESIGNED BY: JG













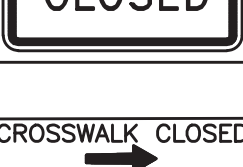
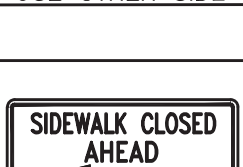
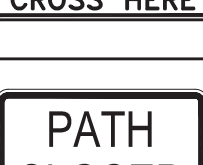


DRAWN BY: JG












CHECKED BY: SM/WW

SHEET NO.  
31 OF 32





E:\Projects\2017\786\000\CURRENT DESIGN\3 TRAFFIC MANAGEMENT PLAN.dwg Printed: 10/23/2019 9:39 AM

CONSTRUCTION SIGN SUMMARY													
IDENTIFICATION NUMBER	SIZE OF SIGN (INCHES)		TEXT	TEXT DIMENSIONS (INCHES)			NUMBER OF REQUIRED SIGNS	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	TOTAL AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE MRK		BACKGROUND	LEGEND	BORDER			
MA-R2-10a	48	36		SEE MASSDOT STD. SIGN BOOK			4	FLUORESCENT WHITE/ORANGE	BLACK	BLACK	MASSDOT SPEC. MOUNT ON POST	12.00	48.00
MA-R2-10e	36	48					4	FLUORESCENT WHITE/ORANGE	BLACK	BLACK		12.00	48.00
MA-W20-7b	36	36					4	FLUORESCENT WHITE/ORANGE	BLACK	BLACK		9.00	36.00
MA-W21-5c	36	36					2	FLUORESCENT ORANGE	BLACK	BLACK		9.00	18.00
M4-8a	24	18		SEE MUTCD STD. DETAIL			2	FLUORESCENT ORANGE	BLACK	BLACK		3.00	6.00
M4-8c	24	18					2	FLUORESCENT ORANGE	BLACK	BLACK		3.00	6.00
M4-9cL	30	24					3	FLUORESCENT ORANGE	BLACK	BLACK		5.00	15.00
M4-9cR	30	24					3	FLUORESCENT ORANGE	BLACK	BLACK		5.00	15.00
M4-9cV	30	24					4	FLUORESCENT ORANGE	BLACK	BLACK		5.00	20.00
M4-10L	48	12					1	FLUORESCENT ORANGE	BLACK	BLACK		4.00	4.00
M4-10R	48	12					1	FLUORESCENT ORANGE	BLACK	BLACK		4.00	4.00
R9-9	24	12					2	RETROREFLECTIVE WHITE	BLACK	BLACK		2.00	4.00
R9-10	24	12					2	RETROREFLECTIVE WHITE	BLACK	BLACK		2.00	4.00
R9-11	24	18					2	RETROREFLECTIVE WHITE	BLACK	BLACK		3.00	6.00
R11-2f	48	30					4	RETROREFLECTIVE WHITE	BLACK	BLACK		10.00	40.00
W1-4R	36	36					2	RETROREFLECTIVE ORANGE	BLACK	BLACK		9.00	18.00
W5-1	36	36					1	RETROREFLECTIVE ORANGE	BLACK	BLACK		9.00	9.00

CONSTRUCTION SIGN SUMMARY																	
IDENTIFICATION NUMBER	SIZE OF SIGN (INCHES)		TEXT	TEXT DIMENSIONS (INCHES)						NUMBER OF REQUIRED SIGNS	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	TOTAL AREA IN SQUARE FEET	
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING		ARROW RTE MRK		BACKGROUND		LEGEND	BORDER					
W11-1	36	36								4	RETROREFLECTIVE YELLOW	BLACK	BLACK			9.00	36.00
W11-2	36	36								4	RETROREFLECTIVE YELLOW	BLACK	BLACK			9.00	36.00
W13-1P	24	24								2	FLUORESCENT ORANGE	BLACK	BLACK			4.00	8.00
W16-7P	24	12								2	FLUORESCENT ORANGE	BLACK	BLACK			2.00	4.00
W16-8P	36	8								10	RETROREFLECTIVE ORANGE	BLACK	BLACK			2.00	20.00
W16-9P	24	12								2	RETROREFLECTIVE YELLOW	BLACK	BLACK			2.00	4.00
W20-1	36	36								4	FLUORESCENT ORANGE	BLACK	BLACK			9.00	36.00
W20-1b	36	36								2	FLUORESCENT ORANGE	BLACK	BLACK			9.00	18.00
W20-4	36	36								4	FLUORESCENT ORANGE	BLACK	BLACK			9.00	36.00
W24-1L	36	36								1	FLUORESCENT ORANGE	BLACK	BLACK			9.00	9.00
W24-1R	36	36								1	FLUORESCENT ORANGE	BLACK	BLACK			9.00	9.00
															TOTAL	517.00	

NOTES:

- SEE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) 2009 EDITION AND ALL REVISIONS, THE 2012 MASSACHUSETTS AMENDMENTS TO THE 2009 MUTCD, THE 2016 MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SIGN BOOK, AND THE STANDARD MUNICIPAL TRAFFIC CODE FOR LATEST SPECIFICATION ON TEXT DIMENSIONS AND COLOR. ALSO REFER TO 2006 MASSDOT SUPPLEMENTAL SPECIFICATIONS TO THE 1995 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES (METRIC EDITION) SUBSECTION M9.30.0.
- UNLESS OTHERWISE NOTED, ALL POSTS TO BE P-5.

LIGHTING DESIGN SERVICES LUMEN STUDIO, INC.		PROJECT: <b>MINUTEMAN BIKEWAY IMPROVEMENTS AT LAKE STREET</b>	
ELETRICAL WIRING DESIGN SERVICES ENGINEERING ADVANTAGE, INC.		DESIGN SUBMISSION: <b>CONTRACT DOCUMENTS</b>	
		DRAWING TITLE: <b>TRAFFIC MANAGEMENT PLAN 5</b>	
		PREPARED FOR:  <b>TOWN OF ARLINGTON ENGINEERING DIVISION</b> 51 GROVE STREET ARLINGTON, MA 02476	
		PREPARED BY:  <b>GREEN INTERNATIONAL AFFILIATES, INC.</b> Civil and Structural Engineers (978) 923-0400 Westford, Massachusetts GreenIntl.com	
SCALE: AS NOTED		DESIGNED BY: AV	
DATE: 10/11/2019		DRAWN BY: AV	
PROJECT NO. 17067.015		CHECKED BY: JG/WW	
NO. DATE		REVISIONS	
		SHEET NO. <b>32</b> OF <b>32</b>	